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PAPER TRADE JOURNAL

Vol. XCVII NOVEMBER 16, 1933 No. 20

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Multiple V-Belt Drive Announcement

ALLIS-CHALMERS Manufacturing Company, of Milwaukee, Wisconsin, announces that licenses under United States Letters Patent No. 1,662,511 relating to power transmitting mechanism, commonly known as Multiple V-Belt Drive, have been granted to the following belt and sheave manufacturers:

The American Pulley Company	Philadelphia, Pa.
The Dayton Rubber Manufacturing Company	Dayton, O.
R. & J. Dick Co., Inc.	Passaic, N. J.
Dodge Manufacturing Corporation	Mishawaka, Ind.
L. H. Gilmer Company	Tacony, Philadelphia, Pa.
Goldens' Foundry & Machine Company	Columbus, Ga.
The B. F. Goodrich Rubber Company	Akron, O.
The Goodyear Tire & Rubber Company, Inc.	Akron, O.
W. A. Jones Foundry & Machine Company	Chicago, Ill.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.	Passaic, N. J.
The Medart Company	St. Louis, Mo.
The Ohio Valley Pulley Works	Maysville, Ky.
Pyott Foundry & Machine Company	Chicago, Ill.
Rockwood Manufacturing Company	Indianapolis, Ind.
T. B. Wood's Sons Company	Chambersburg, Pa.
Worthington Pump and Machinery Corporation	Harrison, N. J.

Allis-Chalmers Manufacturing Company

Milwaukee, Wisconsin

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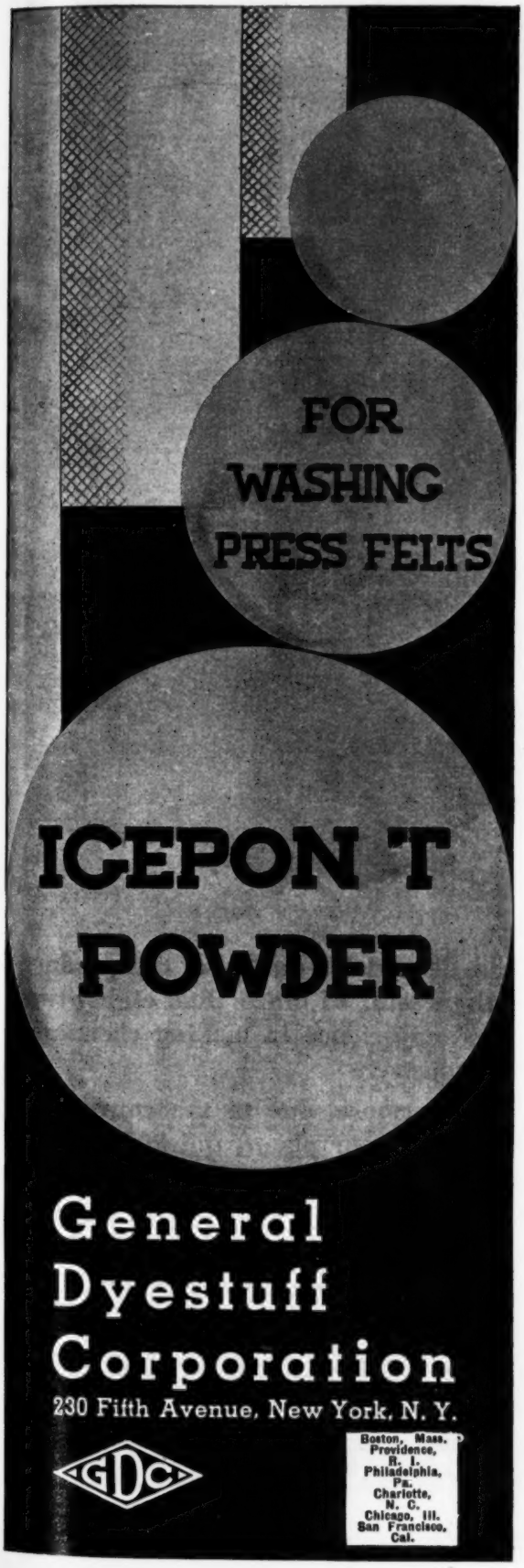

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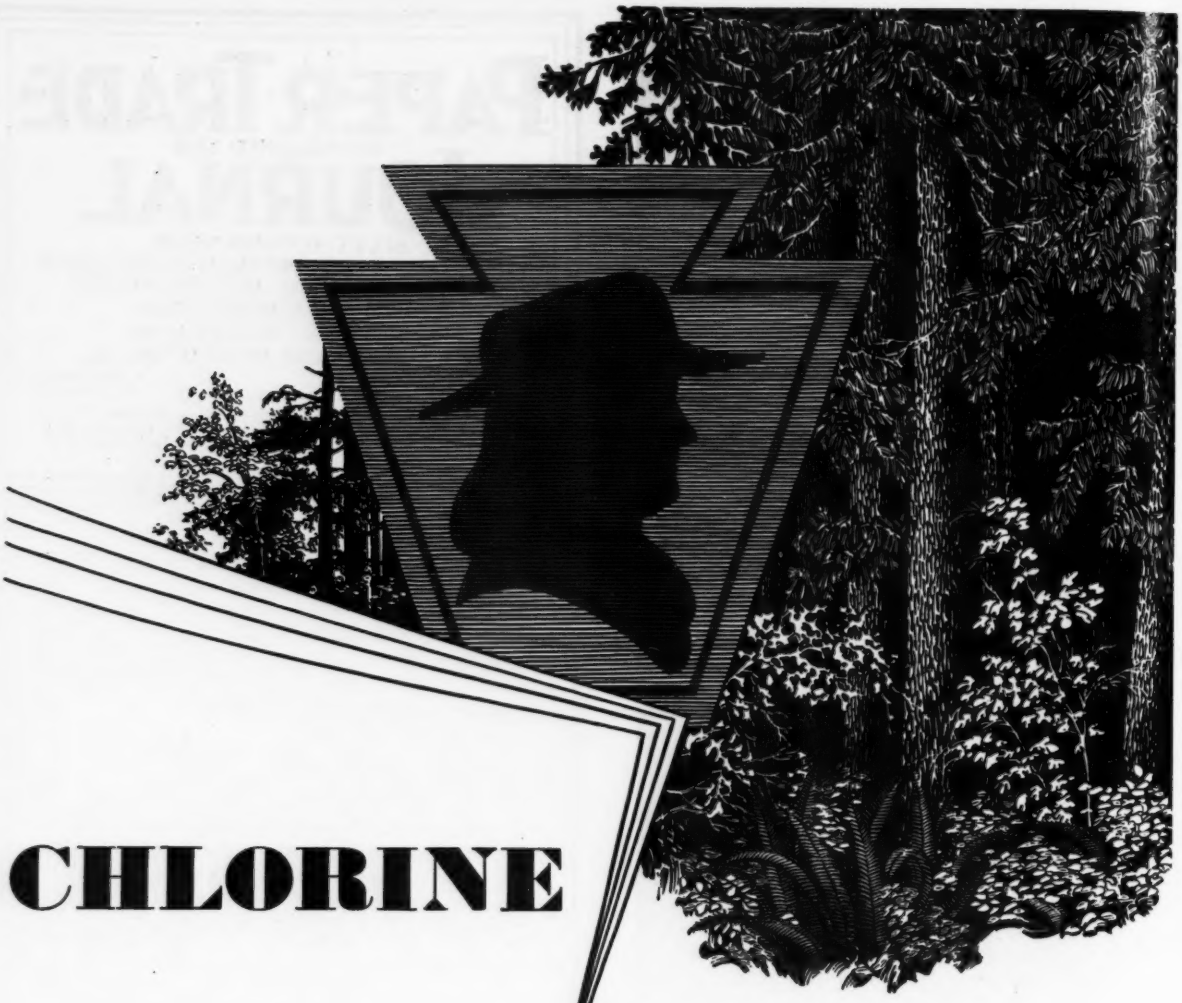

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PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCVII, No. 20 Thursday, November 16, 1933

Paperboard Code To Become Operative Nov. 20

General Paper, Pulp and Newsprint Code Have Been in the Hands of President for a Number of Days and Considerable Speculation is Being Indulged in Regarding the Cause for the Delay in Signing—Labor Conditions Have Been Cleared Up and It is Intimated that Forestry or Pulpwood Are Now Causing the Delay

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 15, 1933—The President signed the paperboard code on Wednesday of last week and it becomes effective on November 20.

The paperboard industry code provides a maximum work week of 40 hours averaged over any period of thirteen consecutive weeks, the hours not to exceed 48 in any one week, with exceptions for watchmen who may work 56 hours hour per week but not more than 8 hours in any one day and chauffeurs, truckmen, switching crews, engineers, firemen and hydro-electric operators who would be permitted to work 168 hours in any four consecutive weeks but not more than ten hours in any one day nor more than 48 hours in any one week.

Divide Country Into Zones

For the purpose of establishing minimum wage scales, the country is divided into a northern, central and southern zone, in the first zone the hourly minimum rate for male help is 38 cents and for female 33 cents, in the central zone the rate is 35 cents for male and 30 cents for female help and in the southern zone the rate is 30 cents for both.

Prior to 1929, the industry gave employment to 25,000 persons. On July 1, 1933, this number had dropped to 19,000 and due to the President's Reemployment Agreement and increased production the total employment is now approximately 22,500. It is estimated that when all the manufacturers in the industry are subject to the code the total employment figure will be on a par with 1929. Total payrolls dropped 39 per cent during the period following 1929 but are now back to a point 2½ per cent under 1929 figures.

The full text of the paperboard code as signed by the President will be found on page 23.

Delay in Signing General Paper Code

The General Paper and Pulp Code and the Newsprint Code has now been in the hands of President Roosevelt for signature for more than ten days.

While no one knows definitely just what the codes are being held up for it is said that Secretary of Agriculture Wallace, wanted to talk with the President either about the forestry conditions in the codes or the pulpwood situation before they are signed.

In other quarters the theory has been advanced that the President might be holding up the signing of the codes because of the Russian situation. It has been rumored here for some time that the Russians have every intention of shipping large quantities of pulpwood into the country if they are able.

It is known on the highest authority, that neither the labor conditions or any other parts of the codes are holding up their signing as those parts have been entirely "cleared." The intimation being, then that either forestry or pulpwood are holding up the signing of the codes and there is no one with any authority can say just when they will be signed. It has happened frequently recently that codes have been signed two or three days before any announcement is made. These announcements are no longer made from the White House as they were at first but are made from NRA headquarters.

Butler-Hurlbut Co. Formed

In 1842 Oliver Morris Butler established the first paper house in Chicago, with a stock of papers which he brought from South Lee, Mass.

Now, almost a century later, this old connection is happily revived in the establishment of a new organization, Butler-Hurlbut Company, located at 223 West Monroe street, Chicago. They will act as direct mill agents as well as distributors for the Hurlbut Paper Company, of South Lee, Mass. The complete line of Hurlbut papers will be carried in stock, insuring the best service and prompt delivery. Orders for fine rag specialties may also be placed with the Butler-Hurlbut Company for direct mill shipment.

News Print Conference Resumed

The joint conference of news print paper manufacturers of the United States and Canada, which was begun in Washington, D. C., last month, was continued at the Waldorf-Astoria Hotel, New York, yesterday. It is understood that one of the matters to be discussed was the continuation of the armistice on prices previously agreed upon for a period of three weeks, which expired November 15.

News Print Operators Discuss Problems

Elimination of Price Cutting and Pooling of Tonnages Taken Up at Various Meetings Held in Connection With Newly Formed Canadian News Print Export Association—Belief Expressed That NRA Will Benefit Industry All Around

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 13, 1933—During the past week various meetings of Canadian news print operators have been held in the offices of the Canadian Pulp and Paper Association in connection with the newly-formed Canadian News print Export Association which is to work with United States news print operators to preserve the price level and practices fixed by the terms of the NRA code for the industry in the United States. Although no public statement has been given out, it is understood that one of the main subjects discussed, aside from the elimination of price cutting, has been that of the footing of tonnage. In this connection it is said that the fight for the control of Price Bros. & Co. has offered difficulty, and has caused some hesitancy over bringing the company into the association. However, it is expected that this question will be settled at an early date.

Meanwhile Robert P. Kernan, president of the Donnacona Paper Company, returning from a conference in Washington of Canadian and American news print manufacturers, has confirmed $40 as the minimum delivered price at Chicago and New York per ton of news print as agreed to by those at the conference.

"I believe President Roosevelt's great experiment is going to benefit industry all around," said Mr. Kernan, "in as much as harmful trade practices, over-production and other causes of present chaotic conditions can with government approval and control be eliminated.

"If the President's aims are carried out, industry will be able to operate on a basis favorable to both capital and labor and at the same time the rights and interests of the consumer will be safeguarded."

Brighter Days for Restigouche Co.

From Saint John, N. B., it is announced that a transformation has taken place in operations of Restigouche Company Ltd., subsidiary of Fraser Companies Ltd. during recent months. The mill at Athol, N. B., has been operating on a 24 hour, seven days a week, basis for some time, and it is learned that the company has been, during the recent months, operating at a profit after making allowance for depreciation, depletion, and proportion of bond interest.

The company, it is understood, has contracted for the entire 1934 output of its Athol mill, which has a daily capacity of 150 tons of sulphite pulp. Wood requirements for this year have been entirely cut, and work has been started on cutting for its 1935 requirements. Lumber operations are also on a substantially more active scale, reflecting the wide improvement in demand for Canadian lumber that has prevailed this year in the United Kingdom. Stocks of lumber at the beginning of the year, plus surplus cut amounting to a total of 25,000,000 board feet, had been disposed of fully as at October 31st last.

Improvement on Pacific Coast

Vancouver despatches state that there has been a general improvement in the market situation for pulp and paper on the Pacific Coast, according to L. W. Killam, president of the British Columbia Pulp and Paper Company. The company's sales, he points out, have been more diversified recently than ever before, and this has led to a greater stability in operation. Instead of being compelled to concentrate on one or two markets, as in the past, the company now exports pulp to the United States, Europe, the Far East and South America. Prices have not been very stable, but the general tendency has been upward.

Decline in the United States dollar has had an advantageous effect by offsetting to some extent the exchange rates under which Scandinavian mills were able to sell in the United States at prices lower than could be met profitably in this country. Scandinavian mills have been compelled to raise their prices as a result of the dollar's drop.

Tennessee Mills Build Warehouse

CHATTANOOGA, Tenn., November 11, 1933—Construction of a warehouse with sufficient storage space to take care of fifty freight car loads of materials by the Tennessee Paper Mills, Inc., has been announced by Hubert Stagmaier, treasurer of the company. Work on the new building is already under way.

The structure, built at the end of the present mill buildings, will have a floor space of 50 x 200 feet and will represent an investment of $10,000. It is being erected by Stein Construction company and the Southern Steel company. It is of steel and concrete construction.

The construction was undertaken to avoid the heavy demurrage charges made by railroads, Mr. Stagmaier explained. In the case of a mill the size of the Tennessee, a slight recession in business or a breakdown may cost hundreds of dollars in demurrage charges, the official explained. The railroads make no concessions and the demurrage regulations often work a hardship upon industries which are the best customers of the carriers, he said.

Capacity of box board manufacturing plants has been steadily increasing due to the growing use of this type of box, which is being substituted for the wooden box due to its small cost, Mr. Stagmaier said. In the case of the Tennessee mills the plant has been enlarged four times since 1919, but the storage capacity has not been increased. In fact, it has been reduced.

Considerable storage space for waste materials is needed, since the mill produces such a wide range of box board. It must keep a considerable stock of this material on hand at all times.

The company has just completed the installation of another unit of stack type driers, which ultimately will make greater production possible through speeding up operations.

Finnish Pulp Markets Quiet

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 15, 1933—The Finnish paper and chemical pulp markets remain quiet according to reports to the Department of Commerce and no new developments are discernible. The event of greatest importance in the paper market is probably the renewal of the "Scankraft convention" for another year.

In the groundwood market a substantial reduction in output is looked for on account of the water shortage, which has assumed a rather serious aspect.

Activities of Fox River Valley Paper Mills

Record Order of One Million Rolls of Christmas Wrapping Paper Completed for Butler Bros. by Tuttle Press, of Appleton—Kimberly-Clark Co. Producing 75,000 Rolls of Wall Paper Daily at Atlas Mill—Machinery Specially Built for Plant

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 13, 1933—An order of 1,000,000 rolls of Christmas wrapping paper just completed for Butler Bros. sets a record for the Tuttle Press Company, Appleton, Wis. It is the largest single order ever received by the company in this particular line.

Volume has increased to such an extent that the company has exceeded at this date its entire production for last year. The plant is going at capacity, with 230 workers, 113 more than a year ago at this time. An order was filled recently for 200,000 folds of crepe for the R. J. Reynolds Tobacco Company for use in 35,000 window displays.

With the repeal of prohibition, the Tuttle company already is experiencing a heavy demand for printed bottle wrappers for wines and liquors. This formerly was an important line at the Tuttle plant. Wrappers for the fruit and vegetable industry also are in brisk demand.

A new line of beverage napkins has been developed to be sold jointly with the millions of coasters now being produced. The coasters are popular with the trade because of their patented features, a waterproof bottom, an absorbent interior, and embossing that prevents the coaster from adhering to the bottom of the glass. These are being used extensively for advertising purposes.

Wall Paper Plant Active

Entering its fourth year in the printing of its own wall paper, the Kimberly-Clark Corporation is now producing about 75,000 rolls daily at its Atlas mill at Appleton, Wis. More than 100 workers are now employed in this division. When the manufacture of wall paper stock was transferred to the Lakeview mill at Neenah, Wis., after its purchase, the company converted the Atlas mill into a printing plant for wall paper rather than abandon it. Most of the machinery was built especially for the plant, and within the last year two larger and faster machines have been installed to replace some of smaller capacity. The engraved rolls are made in a privately operated department for which Arthur Council leases space in the building.

New York artists are making most of the designs and the paper is marketed by the United Wall Paper Factories. It is now supplied to 2,500 dealers and jobbers in the United States and foreign countries. A complete new set of designs is produced each year, but re-runs are made on "best sellers."

Fox River Celebrates Fiftieth Anniversary

This year marks the fiftieth anniversary of the Fox River Paper Company, Appleton, Wis., the oldest western concern engaged in the manufacture of rag content bond and ledger papers. It was founded as the Fox River Flour and Paper Company in 1883, but the flour industry was moving westward and that product was dropped after two years. Two additional machines were then added. In 1920, the corporation bought the Telulah mill of the Kimberly-Clark Corporation at Appleton and equipped it with two more machines, bringing the total capacity up to 50 tons daily.

There are now 500 employes, but not a single one of whom lost his job during the business depression. Although production schedules were curtailed, the work was distributed so no permanent decrease in personnel was necessary. Forty employees have been with the company for more than 25 years, some as long as 30 and 40 years.

The company found its policy successful from the start of specializing on a few uniform brands and has built up a big trade for its well known Wall Street bond, of 100 per cent rag content, and also for Old Badger bond, English bond, New Era bond, Right of Way bond and Ravinia bond. Old Badger, Credit, Battleship and Bank Posting ledgers also have earned a liberal place in the market. Other specialties include manuscript covers, onion skin, drawing papers and mimeograph stock.

De Pere Mill Now Operating

The Brown County Paper Corporation's mill at DePere, Wis., is now employing 35 men steadily and expects to add more when production can be stepped up. The mill has been in production for one week, after being rebuilt following a destructive fire and is meeting with good success in turning out heavy wrappings. Waste paper is being utilized in large quantities and a large amount of commercial pulp also is being purchased. The management declares the outlook is bright for a continuing market for its product.

Paper Mill Accidents Reported

Several accidents have been reported during the last week. Arson Struck, employed at the Interlake Pulp and Paper Company, Appleton, Wis., suffered the dislocation of both shoulders when a bale of pulp was dislodged from a truck and fell on him. At the Thilmany Pulp and Paper Company, Kaukauna, Wis., William Smith fractured his left leg when it became entangled in a revolving gear, and Peter Kamps suffered injury to his eyes when hit by a blast of hot liquid at the sulphate plant.

Not Interested in Mill Project

WASHINGTON, D. C., Oct. 30, 1933.—Acting Secretary of the Treasury Acheson has made the following statement: "In connection with the article which appeared in a local newspaper on October 19, concerning a proposition for constructing a paper mill in Washington, which project, according to the article, is being advocated by Fred A. Berlin, Secretary of the National Board of Trade, Mr. Alvin W. Hall, Director of the Bureau of Engraving and Printing, reported as follows:

"Up to this writing I have not met Mr. Berlin, neither have I talked with him over the telephone, nor have I corresponded with him on the subject of a Government paper mill. Furthermore, I have not furnished anyone any of the information contained in this article. The portions of the article to which my name is attached are inaccurate from beginning to end.'"

The Acting Secretary of the Treasury states that no official of the Treasury Department is interested in the project being advocated by Mr. Berlin.

Chicago Paper Market Conditions Continue Firm

Strength of Various Standard Grades of Paper Obtained Through Earlier Co-Operative Effort Well Maintained—Broader Demand Experienced for Fine Papers—Book and Cover Papers Show Improvement—Paper Stock Slightly More Active

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 11, 1933—Paper prices in the Chicago area remained rather convincingly firm during the week. Strength obtained through earlier cooperative effort is being maintained. Meanwhile demand in certain lines has broadened out and the advent of real cold weather is likely to help in the disposal of seasonal stocks.

Kraft prices remained firm during the week, all gains having been held and demand in certain lines, particularly useful in holiday business, is reported to have picked up noticeably. Broadened demand is reported in the fine paper lines, while books and covers have also experienced betterment. A slight increase in activity is noticed in the waste market, while board and various specialties are sharing in a slight pick-up.

Hand-to-mouth buying, a rather significant development during the last decade which grew through increased transportation facilities and through the practice of manufacturers of keeping sufficient supplies on hand, is likely to receive a decided set back as a universal practice under the present scheme of things. This is the opinion of certain Chicago executives who point to the curtailment in production of many mills as an indication that manufacturers are going to be unwilling or unable to hold the large inventories for hand-to-mouth business. That same increase in overhead and cost of production which seems to have stopped cut throat price manipulation where nothing else is reported to have worked, is reported by these executives as the biggest reason for the change from hand-to-mouth buying to the purchase of larger quantities. Manufacturers are forced to curtail production sharply to meet increased expenses and to more closely anticipate consumer demand. Operating on this basis they are going to find it exceedingly difficult to favor buyers with hand-to-mouth orders. Other factors are entering into the situation including a basic price provision on certain lines and governing certain quantities. The change is an interesting one and there are those who feel that the era of hand-to-mouth buying with all of its manifest difficulties may be drawing to a close. Self preservation is said to be the working motive where other efforts have not been so successful.

News of the Trade

"After your blank forms are laid out . . then what?", is the attention-getting title of the latest direct mail release from the Howard Paper Company sent out this week through the Chicago distributors, the Midland Paper Company, Moser Paper Company, and Parker, Thomas & Tucker Paper Company. The folder contains a color chart showing some of the many ways in which Howard Bond can be used to simplify the most elaborate system of printed forms for department and inter-office use.

Folded neatly into a folder printed on Warren's Cumberland Olympic Gloss White comes a most interesting direct mail piece from the Chicago representatives of the S. D. Warren Company, covering "The secondary sales points which are bringing business". "Quality", says the copy in the inside folder, "may make resales, but only full and complete information can be depended on to bring the first sale". The broadside is designed to show buyers the necessity of bringing their sales manuals, catalogs, bulletins and other printed pieces up to date. The inside folder is printed on Warren's Olde Style-Antique Wove. The opportunity to feature two distinct grades of paper with an unusually timely sales message is well handled by the Warren advertising department.

From the Swigart Paper Company, 717 South Wells street, comes the seventh in a series of close out lists featuring special buys on perfect papers and including quotations on coated books, plain books, ledgers and writings, announcement papers, envelopes, tissues, blottings, manilas, vellums and bristols. The long list contains a comprehensive description of the paper, regular price and lot price.

W. Q. Glass, veteran paper broker, well known in Chicago and Middle Western paper centers died at his home in Riverside, Ill., on Saturday, November 3. A heart ailment is reported as the cause of his death. Mr. Glass had operated virtually a one man brokerage business and the stock on hand is, with his death, being liquidated. Mr. Glass had handled many grades of paper and was thus widely acquainted with paper men in every line.

Carthage Paper Makers Expand

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., November 13, 1933—Extensive repairs are now under way to the largest paper machine at the plant of the Carthage Paper Makers Inc., in preparation for its operation early next month. For the past few months only the small machine at the mill has been operated under a co-operative venture but an increase in orders has resulted in the decision to start the larger machine. A new general superintendent in the person of William H. Siebert has taken charge of affairs at the plant and he is supervising the repair work to the machine by a crew of local workers. It is estimated by officials that the operation of the larger machine will increase production by 50 tons daily besides employing about 60 more men. It was learned that the smaller machine has a daily capacity of about 25 tons. It is understood that increased operations will not result in any other changes at the plant and the directors and officers of the company will remain the same. Large subscriptions in stock of the company have been taken over by local business men in an effort to provide working capital. The plant was leased from the Carthage Pulp and Board Company, after being idle for two years.

Prescribe Reasonable Rate on Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 15, 1933—In the case of the Riegel Paper Corporation against the New York Central Railroad Company, the Interstate Commerce Commission has found that the rate on wood pulp, in carloads, from Dexter, N. Y., to Milford, N. J., was not unreasonable in the past but is unreasonable for the future. A reasonable rate was prescribed by the Commission.

Canadian Wrapping Paper Merchants Organize

Protective and Co-Operative Association for Marketing of Products About to be Launched—Distributors of Paper Bags May be Taken In—Through Economical Operation of Toronto Plant, Hinde & Dauch Paper Co. Reports Improved Position

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 13, 1933—After some months of effort on the part of the distributors of wrapping papers to get together and form a protective and cooperative association in the marketing of their product, wholesalers in Ontario and east to Halifax are about to see the realization of their aims. It is admitted that conditions in the wrapping paper trade have been anything but satisfactory for a year or two back through lack of cooperation on the part of the dealers whom it appeared impossible to get together. This consumation has now practically been effected and while no official announcement has been made, it is known that the organization is about to be launched. A secretary has been chosen and within the next few weeks full details of the aims and objects of the association will be announced. It will take in wrapping paper merchants from Windsor and Sarnia on the west to Halifax on the east, of which there are thirty or more. While so far it has been undertaken to organize the dealers in wrappings only, it is likely that the association will be widened to take in the distributors of paper bags also.

No Pulp "Piracy" Says Finlayson

Charges made by a Liberal candidate in one of the Toronto constituencies that big business pulpwood "pirates" had stripped vast areas of Northern Ontario settlers' lands of tax-free timber were refuted in a statement issued by the Hon. William Finlayson, Ontario Minister of Lands and Forests. Alteration of the system of "pulpwood farming" six years ago, Mr. Finlayson said, provided for strict inspection to see that the required settlement duties were performed. A settler has to get a permit to cut pulpwood, he explained, and then can do it only after he has satisfied inspectors he is doing it in the process of clearing the land. "It can only be sold to the mills under a departmental release," the Minister said, "and before that release is given there must be an inspection to show that the settlement duties have been fulfilled." One half the concessions now held by pulpwood and timber operators, Mr. Finlayson said, were granted prior to the advent of the Ferguson Government and very largely by the Drury Government. Reduction in the departmental revenues from pulpwood taxes, he said, naturally followed from the large decrease in cutting, and Mr. Finlayson scoffed at the candidate's suggestion that the Abitibi company had a monopoly. "As to the Abitibi company's plant at Iroquois Falls purchasing most of its pulp from settlers in Quebec, this always has been the case. The plant is close to the Quebec boundary. It is on Lake Abitibi which lies partly in Quebec. The Abitibi company is the only market for the Quebec settlers of a considerable area and we have never sought to prevent their sale to the company.

No Law to Prevent

"There is no law which could allow us to prevent it and it naturally saves the company cutting on its own limits, conserving them. Our own settlers can sell where they want to, having the advantage of two other mills which, this year, are purchasing pulpwood. The candidate complains of the monopoly held by the Abitibi company. The facts are that this company not only had no monopoly but it was losing money on so great a scale that it went into the hands of receivers, and now the liquidators are operating part of their plants, although three in Ontario, two in Quebec, and one in Manitoba are idle."

Hinde & Dauch Makes Profit

Despite sharp increases in the price of scrap paper, one of its principal raw materials, Hinde & Dauch Paper Company, of Canada, Ltd., has been able to show an improved position in the current year. In the nine months ended September 30 bond interest and depreciation were covered by a good margin through economical operation of the Toronto plant, and this should be increased during the present quarter. On this basis the company will show earnings on the common stock for the first time since 1930 and the 2½ cents per share earned in that year will be exceeded. In 1932 the company had a loss of $57,271 after bond interest and depreciation and in 1931 a loss of $298,466. Improvement in earnings have come from increased volume and further reduction in operating costs. Liner board, the company's chief product, remains at the same price, $42.50 per ton, that has been in effect since June, 1931, although the average price over a ten year period is $60 a ton. It is believed in the industry that an upward revision in price may be effected early in 1934. The paper board division of the company started in 1932 and is stated to have been quite successful and shows a profit.

Increasing Price of Waste Paper

In connection with the position of Hinde & Dauch's affairs it is pointed out that Canadian manufacturers of box boards and liner board used in the container industry have not had the same improvement in business that the industry has had in the United States but has been adversely affected by increasing prices on scrap paper arising from a shortage due to export of this raw material to the United States. Demand for containers in the United States has come as the result of the sale of beer and the stimulus of the NRA. Increased demand raised price per ton on scrap paper $1 a day for two weeks in the New York market where operators of office buildings formerly paid collectors up to $2 per ton to cart the scrap paper away. From an average price of $1 to $2 per ton, scrap paper rose to $17 in the cheapest market for scrap in the country. Prices in Buffalo rose from $5 to $14 per ton. As a result of this demand scrap paper was imported from Canada and the Canadian price rose from $8 to $16 per ton. Only in the past few weeks have prices eased off any.

While the situation in the United States was affecting raw materials in Canada the price of liner board remained unchanged in this country. Prices on bleached and unbleached sulphite, however, are higher, which gives added incentive to some of the news print companies that manufacture liner board to agree to an increased price. Some of these companies have been operating in this line at considerable loss, it is stated.

Philadelphia Paper Market Conditions Improve

Demand for Various Standard Grades of Paper Slightly Better, With Quotations Well Maintained—Paper Stock Distributors Becoming More Optimistic—Lower Grades of Waste Paper Almost Firm on Recently Established Low Levels

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 13, 1933—If business experiences in the remainder of November continue with as steadily an increase as during the first ten days of the month, then the disappointments which the closing days of last month and the first few of this month brought will have entirely disappeared. Complaints—either of business itself or of business methods—are growing scarcer every day. It is not to be assumed that there has been a sudden impetus in buying, for while that does show some slight increase, there is hardly a real forward movement as yet. Only the forerunners of what generally is believed will be such a movement are in evidence. But the conditions under which business is being done are very much improved. In terms of figures, this can best be told by the report that of the aggregate 600 odd customers of fine paper houses in the metropolitan district of Philadelphia, who were placed on the delinquent list on November first—between one-sixth and one-fourth already had their names removed at the close of business last week.

The symposium of opinions on the subject of the credit situation, which was the main topic of consideration at the regular meeting of the Fine Paper Division on Wednesday of last week brought out the fact not only was the goal of a 100 per cent. cooperation in the credit reporting plan virtually attained but that its actual results justified a really optimistic opinion which had been entertained regarding it. It will be recalled that in these columns a week ago attention was called to the fact that the 600 to 700 delinquents represented only a large majority but by no means all who just a week before were delinquent, and that large reductions in this list had been made before the advent of November, when every fine paper house agreed to report all those whose accounts were ninety days due and who thereupon were to be placed on the C.O.D. list. Actual enforcement of this list brought far better results than had been anticipated, and has, undoubtedly, stimulated good feeling in the industry. Fine paper distributors expressed themselves as under a great obligation to the Typothetae of Philadelphia, the organization of master printers, for the thorough cooperation which has been given, and both consumers and distributors engaged in legitimate operation united in the opinion that enforcement of the credit list has almost overnight eliminated the unfair competition which caused distress to so many.

Meanwhile, a thorough study has been made of reports submitted to the Committee on Trading Area of Philadelphia, necessitated, of course, by the requirements of the General Code now in force, and the particular Codes under the NRA which are pending. And finally progress is reported in the study looking to the establishment of uniform trade customs reflecting the similar ones existing among paper manufacturers. While customs regarding allowable percentages for over-runs or under-runs on made-to-order goods in small lots are definitely defined and observed among the makers of papers, there has not been such a complete understanding among the distributors. Major difficulties, however, have thus far been removed, and only some minor ones remain to be adjusted. Reports of progress made on all these problems therefore, made the meeting of the association one of most satisfactory character and was in part responsible for the enthusiasm which greeted the suggestion of President Hentz, presiding, that the most complete possible assistance be given by the paper and allied industries in the pending community chest or the Welfare Campaign, to raise $6,000,000. Mr. Hentz has received assurances from at least twenty men of their willingness to look after welfare work in their respective fields.

As in the paper distributing, so in the paper stock branch of the business these early November days have brought a distinctly better feeling than existed at the close of October. The sag in quotations on Commons seems definitely to have ended, and during the last week they were almost firm on recently established low levels and with every evidence of a greater interest on the part of the mills in obtaining supplies.

Good fellowship in the trade ranks will find a particular form of expression when the Paper and Bag Division of the Philadelphia Paper Trade Association holds its first annual stag dinner at the Broadwood Hotel tomorrow evening, for this occasion more than one hundred reservations already have been made. Addresses have been scheduled by William A. Hentz, president of the Paper Trade Association; Simon Walter, a member of City Council and head of S. Walter & Co., paper distributors; Charles Resnicks, and others. The widely known Hoxie's Harmonica Band will be among the entertainers.

For the second time within a year the Penn Paper and Stock Company has lost its business home. Early on Friday morning the flames swept through its warehouse 238-40 North Delaware Avenue, completely destroying it. Flames, whose origin is still unknown, broke out on the first floor in the building at 240 North Delaware Avenue, spreading with uncontrollable fury to the adjoining structure and through the roof. The Penn Company removed to this warehouse after the destruction of its former warehouse—238-40 North Front street— on January 28th. Announcement was made today that for the time being business of the firm is being transacted from its converting branch at 504 North American street, and that while no rebuilding is in immediate contemplation formal announcement will be sent out in a few days. No definite estimate of loss can be made at this time, but the firm announced that its loss is covered by insurance.

National Container Corporation, manufacturers of corrugated paper boxes, is in new quarters on 51st street below Grays Avenue, with 40,000 square feet of floor space. Additional facilities have been installed and ten additional skilled and forty unskilled workers employed.

Paper Manufacturers Company, Inc., 402-20 North 5th street, has installed additional facilities to increase production, employing ten additional skilled and thirty unskilled workers.

Eastern Paper Salesmen Meet

There was an excellent attendance at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, which was held at the Hotel Woodstock, New York, on Monday last.

Among the subjects discussed freely by those present were the monetary situation and the various provisions of the code for the paper industry which will affect the paper salesmen.

"Gair Old Timers" Organize and Dine

A first reunion dinner of almost 200 present and former members of the Robert Gair Company, Inc., organization was held Saturday evening, October 21, at the Hotel Pennsylvania. The event brought together many who have served in various departments of the Company for long periods of years and others who served in former years on the Gair staff. Former Gair men came from as far off points as Chicago to attend the first reunion dinner.

Officers Chosen

The event resulted in the formation of the "Gair Old Timers" as a permanent body which plans to hold these reunions annually. The officers elected were: Charles F. Stocker of the Grinnell Lithographic Company, as president; D. B. Hassinger of Hassinger Art Service, vice-president and Francis Smith, secretary. Members of the board of directors are: P. F. Gaffney of the Densen Banner Company; W. W. Fitzhugh of W. W. Fitzhugh, Inc.; P. L. Andrews of P. L. Andrews & Co.; Robert Gair, Jr., of Gair Realty Corporation; Harry C. Campbell of Morris Paper Mills, Chicago; Harold Hughes of Pulp and Paper Trading Company; and A. B. Crowell, E. E. Seaver and Felix Doll of the Gair Company.

Several of those who had worked with the late Captain Robert Gair, founder of the company, almost from its earliest days in the pioneering task of folding box and package merchandising development were among those who attended the dinner. The oldest living member of the Gair organization, Frank Marston of Newton Center, Mass., was unable because of his advancing years to be present, but promptly at six o'clock, the entire assemblage drank a toast to Mr. Marston and at that same moment in the library of his home, he drank a toast to those at the dinner. The guests stood silent for a moment in tribute to the memory of Captain Gair.

The "youngest" member of the Gair staff who attended was A. Sandhoff who entered the Gair employ in 1877. Mr. Sandhoff got his job for two years before Captain Robert Gair devised the first multiple machine method for making folding boxes and was with the company during all the years when the cheap folding box which Captain Gair's invention made possible, was being established as the standard packaging and merchandising method for an ever growing list of commodities.

"Gair Old Timers"

Photo shows seated left to right: A Sandhoff of the "class of 1877," Harry Adriance, "class of 1879," George W. Gair, chairman of the board and "class of 1886," John P. Markert, Continental Folding Box Co., Ridgefield, N. J., "class of 1878." Standing left to right: P. F. Gaffney, Densen Banner Co., Ridgefield Park, N. J., "class of 1896;" F. Wasgatt, Gair Co., New York, "class of 1891;" E. Victor Donaldson, president of Robert Gair Co., Inc., "class of 1930;" James Davis, Webb, Jensen & Davis, Brooklyn, N. Y., "class of 1892;" E. E. Seaver, Gair Co., Philadelphia, Pa., "class of 1902;" John Boyce, Gair Co., New York, "class of 1892."

Others among the real "Old Timers" were John P. Markert of the Continental Folding Box Company of Ridgefield, N. J., who came to the Gair Company in 1878, and Harry Adriance of the "class of 1879." All of them

Group Picture Taken at First Reunion Dinner of "Gair Old Timers"

remembered when George W. Gair, now chairman of the board of Robert Gair Company, Inc., came into his father's business in 1886.

Recalls Incidents of Early Days

Mr. Gair recalled many of the incidents of those early days for the benefit of the younger men present and commented on the Gair tradition which holds together all who had served or were still connected with the company. E. Victor Donaldson, president of Robert Gair Company, Inc., spoke of the continuance of that tradition, while E. E. Seaver, now in charge of the Gair Philadelphia sales office, Mr. Gaffney and Mr. Hassinger talked of the past, present and future.

The reunion was the outgrowth of occasional chance meetings of former Gair staff men and was brought about through the interest of Mr. Stocker, Mr. Hassinger and others. In announcing the formation of the "Gair Old Timers," Mr. Stocker said:

Remarks by Mr. Stocker

"It is a pleasant thing for men who have been associated in an office or a plant to get together in subsequent years to renew and to keep alive old friendships, but that is only one of the many reasons for the formation of the 'Gair Old Timers.' Many of us have always felt that there was a tradition among Gair men, a spirit that was unique in business organizations and the fact that almost 200 attended the dinner on Saturday night is evidence of that fact.

Want This Spirit To Continue

"We want this unique tradition and spirit to continue, not merely because of its pleasant associations, but in tribute and reverence to a great man, a pioneer who has impressed his genius indelibly on our times. Captain Robert Gair's ingenious device for multiple machine production of folding boxes made possible the packaging of goods of every sort and contributed largely to our entire present day merchandising structure, our brand names and nationally advertised products sold from coast to coast.

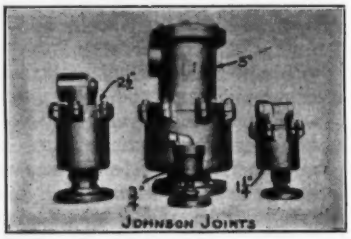
"He took us out of the open cracker barrel era of retailing and paved the way for the modern chain store. Those who have been associated with the Gair Company were pioneers with him in bringing about this revolution in business."

Those Who Attended

Among those who were present at the dinner with the date of their entering Gair employ are: P. L. Andrews, 1897, now P. L. Andrews & Co., New York City; John Boyce, 1892, Robert Gair Company, Inc., New York; H. C. Campbell, 1909, now Morris Paper Mills, Chicago; H. M. Carpenter, 1914, Gair Company, New York; J. H. Cashman, 1914, Pepperell Paper Company, East Pepperell, Mass.; F. Collins, Eastern States Corrugated Company, Brooklyn, N. Y.; H. Costigan, 1908, Brown & Bailey Company, Philadelphia, Pa.; A. B. Crowell, Gair Company, New York; Elmer Curtiss, Gair Company, New York; James J. Daly, 1897, Bogota Paper & Board Corporation, Bogota, N. J.; James Davis, 1892, Webb, Jensen & Davis, Brooklyn, N. Y.; A. Doll, 1914, F. M. Sayford Company, Brooklyn, N. Y.; C. C. Emerson, 1920, Rochester Folding Box Company, Rochester, N. Y.; W. W. Fitzhugh, 1902, W. W. Fitzhugh, Inc., Brooklyn, N. Y.; L. H. Gaetz, 1930, Eastern States Carton Corporation., Brooklyn, N. Y.; F. Gaus, 1821, Folding Carton Company, Maspeth, L. I.; William Glennon, Gair Company, N. Y.; Robert Hogan, National Folding Box Company, New Haven, Conn.; W. F. Howell, 1908, Gair Company, N. Y.; H. Hughes, Pulp & Paper Trading Company, N. Y.; Harvey Jackson, 1808, Harvey Jackson, Inc., New York; R. M. Kennedy, 1923, International Printing Ink Company, Brooklyn, N. Y.; Charles Korte, 1900, Haller & Munro, N. Y.; Paul Lang, 1906 Continental Folding Box Company, Brooklyn, N. Y.; Edward F. McMahon, 1912, National Biscuit Company, Marseilles, Ill.; Harry McPhilliamy, Gair Company, N. Y.; David Nogle, 1914, General Carton Company, Brooklyn, N. Y.; Henry W. Papke, 1906, Teaneck, N. J.; Leslie Rich, 1922, Gardner-Richardson Company, New York; Dr. W. D. Skidmore, 1904, Brooklyn, N. Y.; E. O. Sommer, 1914, Gair Company, New York; Fred Stocker, 1912, Atlantic Gummed Paper Corporation, Brooklyn, N. Y.; H. B. Van Antewerp, 1912, Sinclair & Valentine, New York; F. Wasgatt, 1891, Gair Company, New York; R. O. Williams, 1912, Williams-Bauer Corporation, New York and Walter Turner, 1908, Atlantic Carton Company, Norwich, Conn.

Rotary Pressure Joint

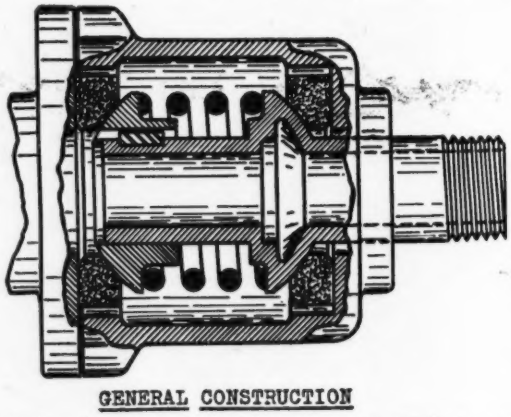
A packless, oilless, non-adjustable rotary pressure joint (steam fit) known as the Johnson Joint is being furnished by the Johnson Corporation of Three Rivers, Mich., for



use on paper machine driers, corrugator rolls, calendar rolls and similar service.

The sectional drawing shows the construction and principle of the joint while the photograph shows four of the various sizes and styles of these joints that are being manufactured.

The construction of this joint provides both lateral and angular flexibility which compensates for movement of



GENERAL CONSTRUCTION

rolls in bearings, pipe expansion, etc. and eliminates strains on the joint from such sources.

The joints are pressure sealed, a special composition seal ring is used which is water lubricated. Joints of this type are operating successfully on 200 lbs. steam pressure and require no oil, adjustment or replacements.

It is reported that over thirty paper plants have adopted Johnson Joints since their introduction in 1930; several of these plants have machines fully equipped with these joints.

Code of Fair Competition for the Paperboard Manufacturing Industry

The following is the complete text of the Code of Fair Competition for the Paperboard Manufacturing Industry, as approved on November 8, 1933, by President Roosevelt:

To effectuate the policies of Title I of the National Industrial Recovery Act, the following is hereby established as a Code of Fair Competition for the Paperboard Manufacturing Industry, and shall be binding on every member thereof.

Article I—Definitions

1. Where used in this Code, the following definitions shall apply:

"Industry"—The manufacture of paperboard in the United States.

"Paperboard."—All paper known as board, regardless of the raw materials from which manufactured, having a thickness of 12/1000 or more of an inch; also of a lesser thickness known as lightweight chip; and also of a lesser thickness manufactured for use as corrugating material and/or container board, regardless of the raw materials from which manufactured; and also specialties not classed as paper, but classed as paperboard according to trade custom.

Notwithstanding the above definition, this code shall not operate on or be binding upon the producers of the following products; namely:

Binders Board and all other wet machine Boards
Bristol Boards
Cardboard and Mill Blanks, coated or surface-treated subsequent to initial manufacture
Bogus Wrapping, Sheathing Paper, Indented, Ham Wrapping
Sulphate Boards and Sulphate Corrugating Materials
Specialty Folding and Specialty Non-Folding Boards, including all boards made from prime or fresh wood pulp, jute stock, and rope stock.

"Member."—A natural person, partnership, association, corporation, trust, trustee, trustee in bankruptcy, or receiver engaged in such industry.

"Act."—Title I of the National Industrial Recovery Act.

"Code."—This Code and all amendments thereto.

"Association."—The National Paperboard Association.

"Administration."—The National Industrial Recovery Administration.

"Administrator."—The National Industrial Recovery Administrator.

Article II—Organization

1. The Executive Committee of the National Paperboard Association is hereby designated as the Agency for administering the provisions of this Code, and is hereby named and is hereinafter referred to as "The Code Authority." The Administrator may designate three persons as additional advisory members thereof; the member or members so designated shall have no vote but in all other respects shall be members of the said Code Authority.

2. The Industry is hereby divided into the following divisions:

1. Eastern Container-Board.
2. Western Container-Board.
3. Southern Container-Board.
4. Eastern Boxboard.
5. Western Boxboard.
6. Corrugating Materials.
7. Pacific Coast.
8. Lightweight Chipboard.
9. Other Board Products.

Any question as to the division into which any particular grade, class, or kind of paperboard, or any product of conversion of any of them may fall, shall be determined by the Code Authority.

3. The expense of administering this Code shall be borne pro rata by the members of the industry who accept the benefit of the Code Authority or otherwise assent to this Code, in accordance with a formula to be adopted by the Code Authority. The Association shall be responsible for the payment of such expense.

Article III—Divisional Codes

1. The members of each division may adopt a divisional code in the manner as hereinafter provided in Article IX, and may submit the same subsequently through the Code Authority to the President for his approval. Such divisional codes, when so approved, shall have the same force and effect as to the divisions of the industry affected thereby as this Code.

2. Such divisional codes shall be subordinate to this Code and shall specifically recognize this Code as applicable to all members of the industry engaged in manufacturing products falling within the division for which such divisional code is submitted.

3. Pending action by the Code Authority, each division shall include such grades, classes, and kinds of paperboard as are generally recognized by custom as falling within the classification indicated by the name of such division.

4. Such divisional codes may contain such provisions relating to said division as may be appropriate for inclusion in a Code of Fair Competition under the Act, provided that no such code shall contain any provision contrary to or inconsistent with the provisions of this Code.

Article IV—Hours of Labor

1. Employees in the industry shall not be required or permitted to work hours in excess of the limits prescribed in the following schedule:

SCHEDULE OF WORKING HOURS

(a) Watchman: Eight (8) hours in any one day and fifty-six (56) hours in any one week.

(b) Chauffeurs, truckmen, switching crews, engineers, firemen and electric and hydro-electric operators, and filter plant employees: One hundred sixty-eight (168) hours in any period of four consecutive weeks, but no more than ten (10) hours in any one day and forty-eight (48) hours in any one week.

(c) Tour workers in continuous process operations: Eight (8) hours in any one day and an average of forty (40) hours per week in any period of thirteen (13) consecutive weeks; provided, however, that additional hours may be worked:

(1) To avoid a shut-down due to the temporary absence of a relief worker;

(2) In changing wires and machine clothing; and

(3) In clean-ups, wash-ups, and ordinary repairs and

adjustments in cases where a machine is shut down for a period of not less than eight (8) consecutive hours.

(d) All other laborers, mechanical workers, or artisans employed in any plant, mill, or factory or on work connected with the operation of any such plant, mill, or factory: An average of not more than forty (40) hours per week in any period of thirteen (13) consecutive weeks, but not more than forty-eight (48) hours in any one week; provided, however, that time worked in excess of eight (8) hours in any one day shall be paid for at not less than time and one-third.

(e) Executives and their personal secretaries and other employees regularly engaged in a supervisory capacity, receiving thirty-five ($35) dollars or more per week, and outside salesmen: no limitation.

(f) All other employees: An average of forty (40) hours per week in any calendar year and an average of not to exceed forty-eight (48) hours per week in any period of thirteen (13) consecutive weeks.

Provided, however, that no limitation on hours of work contained in said schedule shall apply to employees of any class when engaged in emergency repairs or emergency maintenance work involving breakdowns or protection of life or property.

2. At such intervals as the Code Authority shall prescribe, every member shall report to the Code Authority:

(a) The number of man hours worked under subdivisions c (1), c (2), and c (3) of said schedule and the ratio which said man hours bear to the total number of man hours of labor under subdivision c; and

(b) Shall furnish the Code Authority such information as it may require in order to enable it to determine whether the limitations contained in said schedule have been exceeded.

3. No employee shall be permitted to work for more than one member of the Industry an aggregate number of hours in excess of the number prescribed in said schedule.

Article V—Wages

1. The minimum rate of wage of any laborer, mechanical worker, or artisan employed in any plant, mill, or factory or on work connected with the operation of any such plant, mill, or factory shall be as follows:

(a) Northern Zone, which shall consist of all of the territory of the United States except the States named in subdivisions (b) and (c). Male: Thirty-eight (38) cents per hour. Female: Thirty-three (33) cents per hour.

(b) Central Zone, which shall consist of the States of Delaware, Maryland, Virginia, West Virginia, Kentucky, Tennessee, and North Carolina, and the District of Columbia. Male: Thirty-five (35) cents per hour. Female: Thirty (30) cents per hour.

(c) Southern Zone, which shall consist of the States of South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, and Texas. Thirty (30) cents per hour.

Provided, however, that in case the rate per hour for any class of labor was, on July 15, 1929, less than the minimum rate above specified for the same class of labor, then the minimum rate for such class of labor shall be the rate paid on July 15, 1929, but in no event less than ninety per cent of the rate above specified.

2. The Code Authority shall obtain statistical data concerning the effect of the above proviso on wage rates in the Industry and shall within ninety (90) days after the effective date of this Code make a report thereon to the Administrator.

3. Where a State law provides a higher minimum wage than is provided in this Code, no person employed within such State shall be paid a wage below that required by such State law.

4. Pieceworkers shall be paid at rates which will yield a worker for an hour's work not less than the minimum rate prescribed.

5. The minimum rates of wages for all other employees except commission salesmen shall be as follows: Not less than fifteen dollars ($15.00) per week in any city of over 500,000 population, nor less than fourteen dollars and fifty cents ($14.50) per week in any city between 250,000 and 500,000 population, nor less than fourteen dollars ($14) per week in any city between 2,500 and 250,000 population, nor less than twelve dollars ($12) per week in towns of less than 2,500 population.

6. The minimum wages hereby prescribed shall not in any way be considered as a discrimination by reason of sex and where, in any case, women do substantially the same work or perform substantially the same duties under the same conditions as men they shall receive the same rate of wages as men receive for doing such work or performing such duties. The Code Authority shall prepare and file with the Administrator ninety (90) days after the effective date of this Code a description of all occupations in the industry in which women are employed.

7. The wage rates of all employees receiving more than the minimum rates herein prescribed shall be reviewed and such adjustments, if any, made therein as are equitable in the light of all the circumstances, and within ninety (90) days after the effective date hereof the Code Authority shall report to the Administrator the action taken by all members of the industry under this section.

8. A person whose earning capacity is limited because of physical or mental defect, age, or other infirmity, may be employed on light work at not less than eighty (80%) per cent of the minimum wage prescribed in Section 1 hereof, if the State Authority designated by the United States Department of Labor shall have issued a certificate authorizing the employment of such person on such basis, provided, however, that the total number of such employees in any one plant shall not exceed three (3) per cent of the total employees in such plant. So much of this Section as requires the issuance of such a certificate shall not take effect until sixty (60) days after the effective date of this Code.

Article VI—General Labor Provisions

1. No person under sixteen (16) years of age shall be employed in the industry nor anyone under eighteen (18) years of age at operations or occupations hazardous in nature or detrimental to health. The Code Authority shall submit to the Administrator within sixty (60) days after the effective date of this Code a list of such occupations. In any State an employer shall be deemed to have complied with this provision if he shall have on file a certificate or permit duly issued by the authority in such State empowered to issue employment or age certificates or permits showing that the employee is of the required age.

2. Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection. No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing. Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

3. Labor agreements now in force between members and their employees shall be affected only by such provisions of this Code as may prescribe higher wages and shorter hours than are provided for in such agreements.

4. Employers shall not reclassify employees or duties of occupations performed by employees so as to defeat the purpose of the Act.

5. All employers shall post full copies of this Code in conspicuous places accessible to employees.

6. Standards for safety and health shall be submitted by the Code Authority to the Administrator within (6) months after the effective date of this Code.

Article VII—Accounting, Selling

1. The Code Authority shall, as soon as practicable, propose a standard method of accounting and costing for the industry and submit the same to the Administrator. When it shall have been approved by the Administrator, every member shall use an accounting and costing system which conforms to the principles of, and is at least as detailed and complete as, such standard method.

Article VIII—Reports, Statistics

1. Each member shall prepare and file with the Code Authority at such times and in such manner as it may prescribe statistics of plant capacity, volume of production, volume of sales in units and dollars, orders received, unfilled orders, stocks on hand, inventory both raw and finished, number of employees, wage rates, employee earnings, hours of work, and such other data or information as the Code Authority or the Administrator may from time to time require. Any or all information so furnished by any member shall upon the approval of the Administrator be subject to checking for the purpose of verification by an examination of the books and accounts and records of such member by any disinterested accountant or accountants or other qualified person or persons designated by the Code Authority.

2. Except as otherwise provided in the Act, or in this Code, all statistics, data, and information filed or required in accordance with the provisions of this Code shall be confidential and the statistics, data, and information of one member shall not be revealed to another member. No such data or information shall be published except in combination with other similar data and in such manner as to avoid the disclosure of confidential information.

3. The Code Authority shall make to the Administrator such reports as the Administrator may from time to time require.

4. In addition to information required to be submitted to the Code Authority, there shall be furnished to Government Agencies such statistical information as the Administrator may deem necessary for the purposes recited in Section 3 (a) of the Act.

Article IX—Procedure

1. The Code Authority and each division of manufacture created in Article II shall have the right to submit to the Administrator subordinate codes and/or amendments to this Code, in the manner hereinafter set forth.

2. Each and every proposed divisional code or amendment to this Code shall be filed by the proponents thereof with the Code Authority and shall be submitted to the Administrator by the Code Authority.

3. The proponents shall select an Examiner and present his name and address to the Code Authority at the same time the proposed divisional code and/or amendments are filed with the Code Authority.

4. The Code Authority shall immediately transmit to each member of record of the industry a copy of the proposed divisional code or amendments to this Code.

5. Written objections may be filed with the Code Authority by any member or group of members of the industry within fifteen days after the date on which the Code Authority has mailed the copies thereof to the members as above provided. Immediately thereafter the Code Authority shall advise each objector the name of every objector.

6. If no written objections are filed with the Code Authority within said fifteen days' period, the Code Authority shall forthwith present the proposed divisional code or the amendments to the Administrator.

7. If written objections are filed:

(a) Within not less than ten days, nor more than fifteen days thereafter the objector or objectors shall appoint an Examiner.

(b) The two Examiners so appointed shall select a third.

(c) Upon failure of the two Examiners to select the third within ten days after appointment by the objector or objectors, the Code Authority shall request the Chief Justice of the Supreme Court of the District of Columbia to appoint the third Examiner.

(d) Hearings shall be held at such time and places as designated by a majority of the Examiners. Reasonable notice thereof shall be given to the parties interested by the Examiners.

(e) Findings of fact and opinion shall be filed with the Code Authority by the Examiners within thirty days after the appointment of the third Examiner, which findings shall not be binding upon either proponents or objectors. In case of disagreement among the Examiners, both a majority and a minority finding may be filed.

(f) Within fifteen days after the date fixed for the filing of the findings of the Examiners with the Code Authority, the Code Authority shall file the divisional Code or amendment with the Administrator. A copy of the findings of the Examiners shall accompany the filing of the divisional code or amendments if the same has been received. If such finding has not been received by the Code Authority, they shall certify this fact to the Administrator.

(g) Failure on the part of the proponents or the objectors to do the things required above within the time limit provided shall be considered as a waiver by the party so failing of his rights hereunder to require any subsequent step to be taken under the provisions of this Paragraph 7.

(h) The compensation of each of the first two Examiners appointed shall be paid by the persons appointing them. The compensation of the third Examiner and the other expenses connected with the procedure outlined in this Article shall be apportioned between the proponents and the objector or objectors as may be provided by the Examiners; provided, however, the Association shall pay all expenses and compensations incurred under this Article whenever the Code Authority shall have proposed a divisional code or amendment to this Code.

(i) All instruments herein required to be filed shall be addressed to the Code Authority, in care of the Secretary of the National Paperboard Association, at its main office.

Article X—General Provisions

1. If any member is also a member of another industry, the provisions of this Code shall apply to and affect only that part of his business which is included in this industry and if the products of any member fall in more than one division of the industry the provisions of any divisional code shall apply to and affect said member only as to products falling in such division.

2. Any division may formulate a complaint to the President of the United States, pursuant to the provisions of Subdivision (e) of Section 3 of the Act, that any paperboard is being imported into the United States in sub-

stantial quantities or in increasing ratio to domestic production of any competitive paperboard, on such terms or under such conditions as to render ineffective or seriously to endanger the maintenance of this Code, or of any divisional code subordinate hereto and deliver the same to the Code Authority, which shall transmit such complaint to the President.

3. The Code Authority shall have power to investigate alleged violations of this Code and acts or courses of conduct by any member or division which are or appear to be, contrary to the policy of the Act or which tend, or may tend, to render ineffective this Code or any divisional code and to report the same with recommendations to the Administrator.

4. Any work or process incidental to, and carried on by a member at his plant as a part of the manufacture of any product of the industry, shall be regarded as a part of the industry.

5. The Code Authority shall make a study of conditions in the industry to determine the feasibility of the adoption of a shorter working day and shall, within three (3) months after the effective date of this Code, make a report of its findings to the Administrator. The Code Authority shall also submit to the Administrator within six (6) months after the effective date of this Code a plan for the stabilization and regularization of employment.

6. Such of the provisions of this Code or of any divisional code as are not required to be included therein by the Act may, with the approval of the President of the United States, be modified or eliminated, as changes in circumstances or experience may indicate.

7. This Code and each divisional code and all the provisions thereof are expressly made subject to the right of the President, in accordance with the provisions of Section 10 (b) of the Act, from time to time to cancel or modify any order, approval, license, rule, or regulation, issued under Title I of said Act and specifically to the right of the President to cancel or modify his approval of such code or any conditions imposed by him upon his approval thereof.

8. Proposed amendments to this Code or to divisional codes, duly adopted by the organization concerned, in the manner provided in Article IX above, may be presented by the Code Authority to the President and when approved by him, such amendments shall become a part of such code.

9. This Code shall become effective on the second Monday after the date upon which it shall be approved by the President of the United States.

Uniform Cost Activities in Industry

As a means of combating the unsatisfactory conditions that have arisen out of uncontrolled price competition and excessive price-cutting, many business men are giving serious consideration to the need for some plan of uniform cost-accounting and reporting specifically adapted to the problems of their trade and industry. The Policyholders Service Bureau of the Metropolitan Life Insurance Company has prepared a report on the subject, entitled "Uniform Cost Activities in Trade and Industry." It is the result of a review of the uniform cost experiences of more than 76 Trade Associations and sets forth, as well, the opinions and ideas of a number of responsible executives.

Procedures entailed in administering uniform cost activities and methods of preparing uniform cost accounting manuals are discussed. A limited number of copies of "Uniform Cost Activities in Trade and Industry" are available for readers of this publication. Send requests to Policyholders Service Bureau, Metropolitan Life Insurance Company, One Madison avenue, New York, N. Y.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 13, 1933—Approximately sixty attended the meeting of the New England Paper Merchants Association, held at the Chamber of Commerce Friday evening, with representatives from Connecticut, Holyoke, Worcester and Providence among the group. President F. Bendel Tracy was in the chair. Frank B. Cummings, the new executive secretary of the association, spoke on the work of his office. Leon Silver, secretary of the Connecticut Paper Trade Association, spoke on general conditions. After the addresses, meetings of the fine paper and wrapping paper divisions were held, with William N. Stetson, Jr., and Arthur W. Blackman, respectively, presiding.

The Sabin Robbins Paper Company have appointed James L. Ham, of this city, New England representative of their Philadelphia division. Mr. Ham's office will be in the Rice Building, 10 High street, Boston.

The five-story brick building and 13,494 sq. ft. of land at 131-133 Halleck street, corner Station street, Roxbury, have been secured by the Great Eastern Packing and Paper Stock Corporation of New York from the First National Bank of Boston. The property is valued for tax purposes at $40,000, of which $13,000 is on the land.

Harry Miller, dealer in old paper making rope, canvas, etc., lost a considerable part of his rope in a fire which destroyed a large portion of Central Wharf, Atlantic Avenue. It is reported that the loss was pretty well covered by insurance.

West Coast Mills Increase Sales in China

WASHINGTON, D. C., November 15, 1933—That West Coast paper mills both in Canada and the United States have increased their sales of common paper and newsprint in China during recent months is revealed in a report to the Commerce Department from its Shanghai office.

Common printing and newsprint accounted for about 20 per cent of the more than $8,000,000 worth of paper imported into Shanghai in the first eight months of the current year. Canada, Norway, Sweden, Finland, Germany and Austria were the chief sources of origin, with the United States participating to the extent of 7 per cent in this trade. Canada's share of the total in this period was approximately 27 per cent.

In the last few months, the report points out, Scandinavian countries and Germany have figured less prominently in China's imports of paper and the United States and Canada have made notable gains, particularly in newsprint. West Coast quotations are competitive with those of Europe and deliveries are much quicker.

Factors in China's paper trade believe that the semi-official newsprint mill project under consideration, even if it materializes, cannot begin to manufacture any considerable volume of paper for three or four years. In the meantime, as China's demand for newsprint is an expanding one, there will be a good market for the imported product for some time to come, according to the report.

Government Paper Bids

WASHINGTON, D. C., November 15—The Government Printing Office has received the following bids for 3,000 sheets of gray photo mount board; Reese & Reese, Inc., at $49.92 per M sheets; Whitaker Paper Company, $49.98; R. P. Andrews Paper Company, $52.00; Mathers-Lamm Company, $46.52; Milton Bradley Company, $53.90; Charles G. Scott & Co., Inc., $53.90; Barton, Duer & Koch Paper Company, $52.50; and Old Dominion Paper Company, $52.00.

Obituary

Charles W. McAlpine

[FROM OUR REGULAR CORRESPONDENT]

SOUTH BEND, Ind., November 11, 1933.—Charles W. McAlpine, vice-president of the Nicely Bros. Paper Company, a resident here for more than thirty years, died November 3 after a two weeks' illness with a heart ailment.

Mr. McAlpine, born in Lee, Mass., September 8, 1861, came here from Philadelphia, Pa., and was engaged for many years in the manufacture of paper. His father, the late Robert McAlpine, was one of the pioneer paper manufacturers in this country, and was the first successfully to use wood pulp in the making of paper. From his mother he inherited a distinguished ancestry, being the descendent of two colonial governors of Connecticut, Governor Welles and Governor Webster.

During the world war two of his sons, both of them graduates of Central Senior High School died in service. Lieut. Malcolm McAlpine died at Pershing's headquarters in Chaumont, France, and James R. McAlpine died in the training camp at the University of Michigan just four days later. Malcolm was one of the first American aviators to fly over the German lines, and brought down two German planes.

After the death of Mrs. Edith Wright McAlpine, Mr. McAlpine married Myrtle Severance, of this city, on December 22, 1925. She survives, with her daughter, Mrs. G. R. Huntoon, of Detroit, Mich. He leaves also a son, Roderick McAlpine, of New York city; a sister, Mrs. Luther K. Mackeil, of Helena, Mont.; a brother, Frederick McAlpine, of South Bend, and a niece, Miss Jean McAlpine, this city.

Rev. Dr. Nehemiah Boynton

[FROM OUR REGULAR CORRESPONDENT]

BEDFORD, Mass., November 11, 1933.—The Rev. Dr. Nehemiah Boynton, chaplain of the American Paper and Pulp Association for many years, author, lecturer and former chairman of the World Alliance for the Promotion of International Friendship Through the Churches, died at his home here on November 9. He was seventy-six years old.

He married Miss Mary Ella Wilcox, of Boston, on July 5, 1882. Four sons and three daughters were born to them. Two of his sons, Edward C. Boynton, of Scarsdale, N. Y., and Russel Boynton, of Chicago, are clergymen, and a daughter, Grace Morrison Boynton is a missionary in China. Other children were Daniel Wilcox Boynton, Nehemiah Boynton, Jr., Mrs. Elizabeth Patton and Mrs. Marjorie Rugg. Only his children survive.

Edwin C. Weiser

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., November 14, 1933.—Edwin C. Weiser, aged 81, for many years connected with the Parsons Paper Company, died early Saturday morning at his home, 226 Pine street, He was born in York, Pa., and came to Holyoke in 1872 where he entered the employ of the Parsons company as a minor official and worked his way up to paymaster, secretary and assistant treasurer of the company. When the No. 1 Mill was taken over by the American Writing Paper Company he was made manager. Failing health compelled him to give up work after a year or so of service. In 1900 he was appointed assistant to the trustees of the estate of Whiting Street, who was a large stockholder of the Parsons Paper Company, and who left his entire estate to charitable purposes. Mr. Weiser married in 1890 Lucy Bagg Brooks, daughter of Mr. and Mrs. Ethan Brooks of West Springfield, who survives him with three children; Richard M. and Helen B., of this city, and Mrs. Catherine Avirett, of Deerfield.

Roy Casey

Roy Casey, who has been with the Missisquoi Corporation, manufacturers of fine card board and specialties, Sheldon Springs, Vt., since 1928, died at his home, 29 Federal street, Springfield, Mass., after an extended illness, on Wednesday evening, November 1. He is survived by his widow, the former Margaret Lancour, a daughter, Margot Jane, and one brother, Howard, who is connected with the Old Hampshire Paper Company.

Roy Casey represented the Missisquoi Corporation in New York and Chicago for several years. Prior to this he was connected with the Chemical Paper Manufacturing Company. He was born at Holyoke, Mass., and was 37 years of age.

His many friends, and his associates at the Missisquoi Corporation deeply mourn his passing.

Henry Dickhaut

SAUGERTIES, N. Y., November 11, 1933.—Henry Dickhaut, widely known in the paper manufacturing industry and a village trustee of Saugerties, died October 28 of heart disease in St. Peter's Hospital, Albany. His age was 72 and he was born in Albany.

Mr. Dickhaut was superintendent of the Martin Cantine Company, paper manufacturers, of Saugerties, until his retirement several years ago. He was a director of the concern, and also of the Saugerties Bank, a member of the Saugerties Club, and a Mason.

He leaves a widow, two sons, Stephen and Charles Dickhaut, and three daughters, Mrs. Margaret Abeel, Mrs. Charles Brice and Mrs. Herman Smith.

Tensilastic Rubber Covering

Considerable interest has been created by the announcement by the American Wringer Company, Woonsocket, R. I., that through a newly developed method of anchoring the cover to the brass shell, rubber covered suction rolls can now be supplied with their remarkably efficient tensilastic rubber covering.

As Mr. Brown, sales manager of the American Wringer Company says, "The Tensilastic compound has given such a good account of itself in other roll positions that naturally paper mill superintendents are interested in the tensilastic rubber covered suction roll."

Tensilastic rubber covered suction rolls have been tested in the American Wringer Company laboratory and after convincing tests were placed in mills where their performance was so unusual as to arouse considerable interest in this new development. In one instance, the Tensilastic rubber covered suction roll has been running over a year without grinding. In every installation this new roll is doing a real job.

The Tensilastic compound, produced exclusively by the American Wringer Company's method of laboratory control in processing, has been outstandingly successful in all types of rubber covered rolls. It is unusually resistant to oxidation, deterioration, distortion, corrugation, wear and abuse, true in density and tensile. These qualities add greatly to the value of suction roll equipment.

It is claimed that the tensilastic rubber covered suction roll eliminates shadow marks, crushes, wet felt trouble, and excessive broke, a feature deserving every superintendent's attention.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Chattanooga, Tenn.—The Tennessee Paper Mills, Inc., has approved plans for construction of new addition to plant, to be used for storage and distributing service, and will proceed with superstructure at once. It will be one-story, 50x200 feet, reported to cost about $25,000, with equipment. General contract has been let to the Stein Construction Company, San Antonio, Tex. Hubert J. Stagmaier is treasurer.

Wausau, Wis.—The Minnesota Mining and Manufacturing Company, Forest street, St. Paul, Minn., manufacturer of abrasive papers, granular roofing products, etc., has completed plans for construction of new addition to branch mill at Wausau, about 26x36 feet, to be used for raw material service. General contract has been awarded to William Murphy & Son, New York Life Building, St. Paul. Toltz, King & Day, Inc., Pioneer Building, St. Paul, is architect. Work will be placed under way at once.

Philadelphia, Pa.—The Penn Paper and Stock Company, 238-40 North Delaware avenue, is considering rebuilding of storage and distributing plant, location noted, recently damaged by fire. An official estimate of loss has not been announced. Company operates another warehouse unit at 504 North American street.

Albany, N. Y.—The Hygienic Products Corporation, Albany, pulp and paper products, is arranging for the sale of a bond issue to total $225,000, portion of fund to be used for general operations and expansion.

Brooklyn, N. Y.—The Beatswood Corrugated Container Corporation, recently organized with capital of 200 shares of stock, no par value, is said to be planning early operation of local plant for the manufacture of corrugated paper boxes and containers. New company is represented by F. G. Baum of Cohen, Cole, Weiss & Wharton, 61 Broadway, New York, attorneys.

Chicago, Ill.—The American Colortype Company, 1151 Roscoe street, manufacturer of paper goods, has taken out a permit to construct a one-story addition to paper converting plant, to be used for storage and distributing service. General contract recently was awarded to Otto Randolph, Inc., 53 West Jackson boulevard, city. It will cost about $24,000, with equipment. Condron & Post, 53 West Jackson boulevard, are architects.

Clarksburg, W. Va.—New paper box-manufacturing plant of the Hazel-Atlas Glass Company, Wheeling, W. Va., at Clarksburg, recently referred to in these columns, will be one-story, 100x250 feet, and equipped for large capacity. It is proposed to have the unit ready for occupancy at early date. List of equipment to be installed has been arranged. It will cost over $35,000, with machinery, instead of smaller amount, previously noted. Hutter Construction Company, Fond du Lac, Wis., is general contractor.

Long Island City, N. Y.—The Union Bag and Paper Corporation, Woolworth Building, New York, has arranged for a lease of its storage and distributing building at Van Alst and 51st avenues, Long Island City, 80x200 feet, totaling 48,000 square feet of floor space, to the Sheffield Farms Company, Inc., which will take possession on February 1 next, using for another line of service.

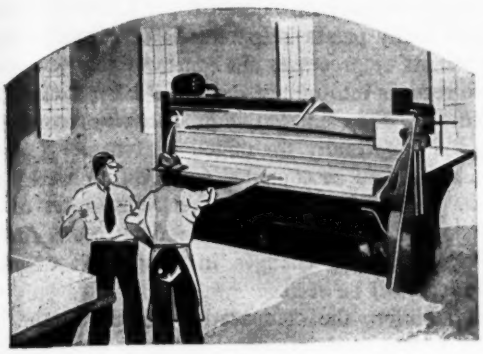
Whippany, N. J.—The Whippany Paper Board Company, Inc., has been organized under the direction of Charles Handler, 790 Broad street, Newark, N. J., representative, to operate a local mill for the manufacture of paper board products. It is proposed to begin production at early date. New Company is capitalized at 2500 shares of stock, no par value.

St. Charles, Ill.—The United States Printing and Lithographing Company, manufacturer of paper containers; cartons and other paper goods, has awarded general contract to C. A. Anderson, St. Charles, for proposed new addition to local plant, previously referred to in these columns, to be one-story, 97x380 feet, estimated to cost about $75,000 with equipment. Robert Salisbury, Liberty Building, Wheaton, Ill., is architect.

Hantsport, N. S.—The Minas Basin Pulp and Paper Mills, Ltd., Windsor, N. S., affiliated with the Scott Paper Company, Chester, Pa., has made application to the Provincial Government for a loan of $200,000, the fund to be used for general expansion and operations. Company is said to be planning increase in power facilities, owing to difficulty in securing sufficient supply from present hydro-electric power source, and also proposes to build two new plant units, one of which will be used for expansion in the ground wood pulp department, and the other for the manufacture of a line of molded pulp specialties. It is expected to proceed with program as soon as financing has been arranged; preliminary plans have been drawn.

Montreal, Que.—The J. R. Walker Company, Ltd., paper products, is considering early rebuilding of four-story storage and distributing plant, recently destroyed by fire with loss estimated at close to $200,000, including building, stock and equipment.

Takasago, Japan—The Kanegafuchi Spinning Company, Ltd., Tokyo, Japan, is planning construction of a new viscose products plant for the production of cellulose rayon specialties, etc., at Takasago, where a 240-acre tract of land has been selected. Project will consist of a number of main production units, pulp buildings, chemical plant, storage and distributing buildings, power house and other mechanical structures. It will be equipped for an initial capacity of 5 tons per day, and is reported to cost over $800,000, with equipment. Initial units are expected to be ready for service next year.

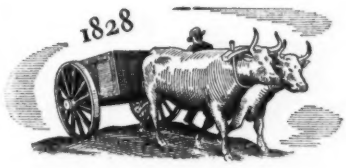


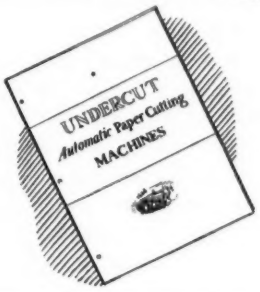
Is any Cutter TRULY SAFE *without this Feature*

The best man-made safety devices sometimes fail. The blame, whether machine's or operator's, is unimportant compared to the human damage done.

S & W trimmers have the man-made safety devices of other cutters plus the constant safety of the Undercut principle. With Undercuts the knife works from below. It is *always down* away from fingers, hands, arms. Failure of machine or operator and the knife does not *drop*. It will not follow its cutting stroke. In Undercuts alone gravity acts as a constant guard against accidents. It prompts us to ask, "Is any cutter *truly* safe without this feature?"

The safety of the Undercut principle, exclusive with S & W trimmers, is fully explained in the bulletin shown below. Mention T-11 when writing for your copy.





S & W cutting sticks will save your finishing room countless $3.00 or $4.00 grinding jobs. They stop frequent tie-up to replace knives. Bulletin T-11 brings the facts.

★

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FORESTALLING LABOR TROUBLES

The modernization of plant equipment is being advocated from many sources and for many reasons. One of the most important has probably been overlooked.

The rising trend in industrial activity during the past summer brought with it widespread labor disturbances involving a large number of workers. A study of economic history shows (1) that labor disputes increase in a period of rising prices and (2) that the industries which suffer least are those in which there have been the greatest development in machine efficiency and the highest productivity per worker.

These facts and others brought out in an interesting booklet entitled "Forestalling Labor Troubles" by the Farrel-Birmingham Company of Ansonia, Conn., lead to the conclusion that industry has within its own power a means of averting the economic losses attendant upon labor troubles.

Increasing individual productivity and earning capacity, reducing arduous labor and eliminating unpleasant or hazardous working conditions, through the installation of improved machinery, have been a most effective means of insuring industrial peace by removing the fundamental causes underlying a desire on the part of labor to organize.

In the period of rising demand and increasing production ahead of us, profits and freedom from labor strife are most likely to accrue to those industries which are willing to take steps now toward the modernization of their equipment.

The booklet under the sub-caption of "Increased Productivity" states that

"Perhaps the soundest means of measuring the productivity of labor is that developed by Alford and Hannum, namely, value or quantity of output per 1,000 man-hours.

"A great many plants keep records of physical output by departments or processes but comparatively few translate those records into output per 1,000 labor hours. The consequent lack of a comparative *productivity* record often obscures the opportunity for effecting savings.

"If such a record be compiled for the four weeks preceding the shorter hours and higher wage rates of the NRA Code and compared with a similar record for the four weeks following changes in hours and wages, a striking effect will be seen.

"If, in addition, the comparative output by the two periods be broken down into departments or processes, and the output per 1,000 man-hours for each department found, management can instantly mark the departments requiring immediate attention.

"Physical output per 1,000 man-hours will be found to have dropped most in those departments where: (a) the process called for the greatest amount of hand labor, and/or the greatest amount of skill; (b) and in those departments where the machinery used is 'general' purpose rather than 'special' purpose equipment.

"Any such analysis by departments of output per 1,000 man-hours of labor will serve to show further that the greatest productivity in relation to work hours is achieved when the machines rather than the operators are responsible for precision and skill.

"The greater the transfer of skill to mechanism, the greater the output per 1,000 man-hours of labor.

"Relieving the operator of the larger portion of the responsibility for accuracy causes the output per 1,000 man-hours literally to jump.

"These and the preceding figures are given to illustrate the heretofore neglected point that improved machinery not only increases production, but what is infinitely more vital to industry, it increases individual productivity . . . it gives business the means to get something in return for its increased payroll.

"In the decade between 1920 and 1930, when demand became increasingly greater, it became common to speak of machinery as a means of increasing total production, of saving labor. In consequence, nearly all factory records were set up to compare weekly or monthly output; the greater that output, the more efficient a plant was supposed to be.

"Conditions have now changed. It is not a question of increasing production or productive capacity. The real question is that of increasing the output per 1,000 man-hours of labor. With a week shorter by 15 to 30 per cent according to the various code provisions, output can no longer be measured by the calendar or the clock. The true basis of comparison is now the physical output per 1,000 man-hours; the value of that output against the cost of the thousand man-hours.

"Such records permit constructive management activity in three directions: (a) purchase of the right type of improved equipment and its installation in the departments where output per 1,000 man-hours is now lowest; (b)

prevention of an increase in payrolls more rapid than the increase in output; (c) avoidance of labor disputes.

"As indicated by the records previously cited, labor troubles are invariably greatest in those industries or processes where productivity per worker is lowest. Low productivity is most frequently accounted for by the fact that the equipment in use, (1) necessitates too much work of an arduous nature, and/or (2) the work is done under more or less unpleasant conditions arising from dust, fumes, heat, danger of accident, etc.

"Wherever equipment has been replaced by improved designs which permit the worker to increase his output per 1,000 hours, it has been found that the machine (a) relieves the worker of much of the former strain and fatigue, and (b) eliminates much of the complaint occasioned by unpleasant or hazardous working conditions.

"Both such advantages serve to eliminate the fundamental causes underlying a desire on the part of labor to organize. Inasmuch as labor has now secured almost idealistically shorter hours, the only remaining incentives to collective bargaining, unionism and organization have to do with either wage rates or working conditions.

"The advances made in machinery improvements during the past few years make it possible to reduce or eliminate entirely all three of these incentives to unionism. Machinery which increases output per 1,000 man-hours makes it possible to voluntarily pay higher wages without jeopardizing business profits. That alone eliminates some 60 per cent of the cause of labor disputes. And at the same time, the newer designs in equipment diminish enormously the strain and fatigue of operation, as well as the hazard common to many processes where older equipment is now used.

"We are probably entering, if the trend of world conditions can be taken as an indication, a period of rising demand and increasing production. It is in just such a period that the maximum labor difficulties may be expected.

"It is not too much to say that the profits, as well as the relative security of industry from the demands of organized labor, will very greatly depend upon a willingness to take steps toward the modernization of equipment and to take them now."

Boston Paper Market Irregular

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 13, 1933—Paper jobbers, as a whole, reported a quiet week, although in a few individual cases somewhat more favorable comment was made. At one large house it was stated that the last two weeks had been fairly active, but that it was slow Friday on account of the coming holiday. Another firm handling fine paper only noted the market as "pretty good," and at the local office of a manufacturer "just fair." In wrapping paper, there was considerable inactivity, "pretty quiet," and "very spotty" being among the expressions heard. Box board quiet and spotty, although price levels remained the same. In box coverings there was a fair degree of activity. Paper stock reflected the general condition of the consuming markets and was reported as extremely quiet. Price levels remained unchanged.

Coulter D. Young Heads Committee

Coulter D. Young, secretary of the International Paper Company, will head the paper industry division of the Family Welfare Committee's Campaign for $4,000,000 to help the New York family relief societies.

The paper group is identified with the Commerce and Industry Committee. The money is to go toward financing welfare activities not included in government relief. This group was associated with the Gibson Committee last year. It numbered 233 active workers. These obtained a total of $96,000 from 1446 persons and corporations in the industry.

Mr. Young is forming an organization similar to that built up by Adam K. Luke, president of the West Virginia Pulp and Paper Company, who was 1932 chairman. For the purposes of the campaign, which opens November 15, the industry will be divided into eleven sub-divisions to assure a complete canvass.

Though city, state and federal governments are assuming a larger share of the burden of unemployment relief than here-to-fore, the need of private relief to care for "human needs" continues. The family relief societies assist thousands of men and women who are still suffering from the results of the depression to solve their individual problems. They also extend other assistance not within the scope of the public relief programs.

"I am glad to be able to help the Family Welfare Committee by accepting the position of chairman of the Paper Industry Division," Mr. Young stated. "I am convinced that these activities of the family relief societies must be supported by a fund-raising campaign planned to alleviate distress and I am certain the Paper Industry Division will support this year's campaign as whole heartedly as it has the campaigns of previous years. The time devoted to such a cause will be well spent."

The group headed by Mr. Young is one of eighty subdivisions of the Commerce and Industry Division organized for the campaign. The Division is counted on to raise a large part of the fund.

Pacific Paper Mill Workers Organize

Permanent organization of a Pacific Northwest pulp and paper employees' conference by delegates representing American Federation of Labor locals in Washington and Oregon and including Eureka, Cal. and New Westminster, B. C, was effected at Longview, Wash., October 30.

E. P. Fourre of Shelton, Wash., was chosen president, J. Reiners of Port Angeles, vice-president and J. Sherman, Port Angeles, secretary-treasurer. A committee on by-laws was named consisting of H. M. Grimes of Port Angeles, R. McCann, Shelton and E. D. Browne, Vancouver, Wash.

Speakers at the meeting included representatives of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, James A. Taylor, president of the Washington State Federation of Labor and Ben T. Osborne, executive secretary of the Oregon federation. The next conference will be held at Port Angeles, Wash.

Swedish Newsprint Production

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 15, 1933—Newsprint production by Swedish mills during the month of August totaled 22,864 metric tons, a decrease of 215 tons under the preceding month, but an increase of 3,484 tons over the same month of last year.

FOR THE NEW COMPETITION

Profitable Opacity

Giving a very evident stamp of quality to your product

Making type matter stand out clearer and brighter

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Adding richness to quality papers

Improving inexpensive papers

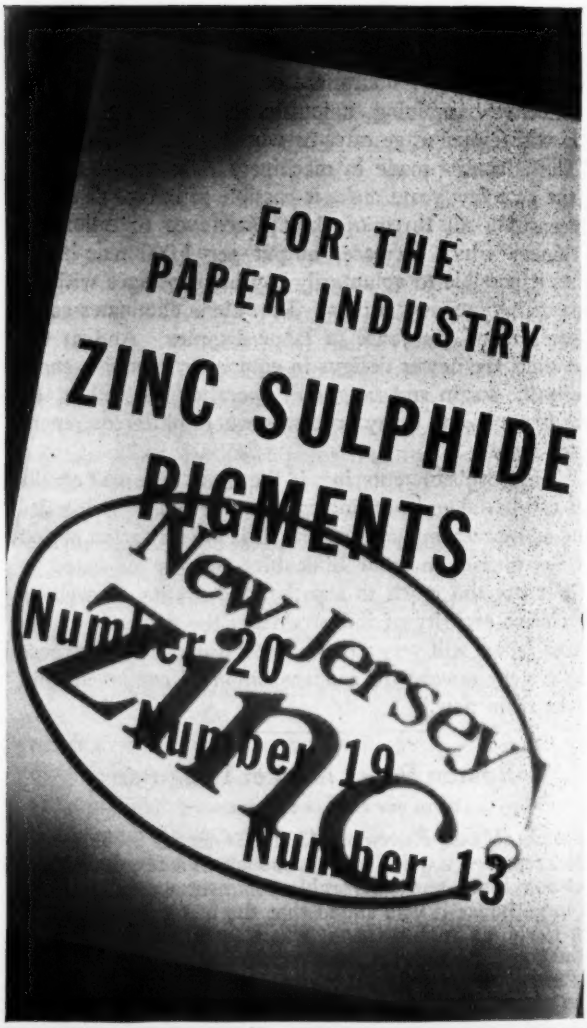
Superior Color

Making "white" paper WHITE

Putting a "snap" into advertising matter

Zinc Sulphide Pigments

Available in a range of strengths to provide OPACITY, COLOR, and BRIGHTNESS for your products in the degree you desire.



THE NEW JERSEY ZINC COMPANY

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205 Wacker Drive, Chicago
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1105 Merchants Exchange Building, San Francisco

Section of the
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Edited by Ronald G. Macdonald, Secretary

Analysis of Alkaline Black Liquors of Varying Sulphidity by Ammonia Distillation Method*

By M. A. Heath[1], M. W. Bray[2] and C. E. Curran[3]

Abstract

In a previous investigation of the standard methods of analysis of spent "black" liquors from the sulphate and soda processes, the possibility of obtaining more accurate results by means of distillation with an ammonium salt was suggested, and a method was outlined. The primary object of the present work was to develop further this method and to test the accuracy of the results obtained through its use. As a first step the procedure was modified in several particulars which are described in detail later in the report, and which resulted in satisfactory and reproducible analyses when used with black liquors. As a further check on the method, a series of bomb scale digestions was made, using Douglas fir as the wood and varying the sodium sulphide content of the initial cooking liquor from 0 to 100 per cent, but maintaining the free alkali content (calculated as NaOH) approximately constant. The subsequent analysis of black liquors of widely varying composition were then compared with like analyses made by the method now in use at the Forest Products Laboratory. At the same time additional knowledge was gained of the part played by sodium sulphide in the sulphate process.

Ammonia Distillation Method for the Analysis of Cooking and Spent Liquors

Laboratory use of the ammonia distillation method as originally suggested *(1)* indicated several sources of error as well as inconvenience in application. The method as described here has therefore been modified considerably. When the original procedure was applied to a sulphate liquor, sodium sulphide was first destroyed by oxidation with hydrogen peroxide, so that the sodium hydroxide and sodium carbonate could be determined. The distillation of a second sample into standard iodine solution was then necessary in order to determine sodium sulphide. Besides requiring a second distillation this procedure and the destruction of excess hydrogen peroxide was rather troublesome in actual practice. Moreover, some data obtained indicated that the introduction of such a vigorous oxidizing agent considerably affected the composition of the black liquor, hence the subsequent determination of sodium hydroxide and sodium carbonate would not in all cases represent the conditions existing in the sample. The first change in the method, therefore, was to omit the hydrogen peroxide treatment and to determine sodium hydroxide, sodium sulphide, and sodium carbonate in one operation.

A second change was made in order to avoid determining organic salts as carbonates. It was found that some volatile organic acids, such as acetic acid, were distilled over into the first receiver, which contained standard alkali. Standard acid was, therefore, placed in the first receiver, along with standard iodine solution. Considering the distillation products as carbon dioxide, hydrogen sulphide, organic acids, and ammonia, the reaction in the first receiver oxidizes the hydrogen sulphide and neutralizes the ammonia. Organic acids are evolved as ammonium salts, but do not noticeably affect the methyl orange endpoint.

A third change in the method was made in determining carbon dioxide. Instead of absorbing it in a standard alkali solution, it was found more satisfactory to absorb it in an ascarite bulb (dry sodium hydroxide distributed on asbestos) and determine the corresponding increase in weight. By keeping the first receiver warm and passing air through the apparatus throughout the distillation, the carbon dioxide is completely driven over.

A fourth change in the method was made necessary by the presence of organic salts. To correct for this error it is necessary to determine the corresponding amount of nonvolatile acids remaining in the distilling flask. Methyl red may be used as an indicator in the presence of ammonium salts, so that the acidity of the residue after distillation is determined by titrating an aliquot portion to a methyl red endpoint. If acids are formed which are too weak to be titrated in this way, their sodium salts are likely to be completely hydrolyzed, consequently the determination and calculation of such salts as free NaOH is justified.

The distillation is carried out in an apparatus as shown in Fig. 1. 5 cc. of the liquor to be analyzed are placed in flask C. 25 cc. of 10 per cent ammonium chloride solution diluted to 100 cc. with carbon dioxide free water are

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[3] Member TAPPI, principal chemist, Forest Products Laboratory.

added. Receiver D contains known amounts of standard iodine solution (neutral to methyl orange) and standard sulphuric acid solution; for example, 50 cc. N/10 I_2 and 50 cc. N/10 H_2SO_4. E contains 10 cc. of N/10 thiosulphate, the purpose of which is to prevent any loss of iodine. H is a weighed ascarite tube for the absorption of carbon dioxide. Air is passed through the apparatus at the rate of about three bubbles per second. The solution in flash C is distilled over, first operating the condenser with air. When the solution in receiver D becomes hot the condenser is operated with water. The heating of the solution in D is to avoid loss of carbon dioxide by remaining in solution in this receiver. Distillation is continued until at least 50 cc. of liquid have been collected in D. The flame is then turned off and air passed through the apparatus for 15 minutes longer in order to drive all the carbon dioxide through into tube H.

Tube H is then removed and weighed. The increase in weight in grams multiplied by 454.5 equals the volume in cubic centimeters of N/10 sodium carbonate present in the liquor. The volume in cc. of N/10 sodium carbonate multiplied by 5.3 and divided by the number of cc. of sample added (5 in this case) equals the concentration of sodium carbonate expressed in grams per liter.

The contents of flask C are cooled to room temperature, placed in a volumetric flask, and diluted to the 100 cc. mark. 25 cc. are drawn off and titrated to a methyl red endpoint with N/10 sodium hydroxide, diluting the same sufficiently to obtain a clear endpoint. When multiplied by 4, this figure is designated titration No. I. It represents organic acids derived by hydrolysis of the corresponding ammonium salts, of which the ammonia has been distilled off leaving the acids in the distilling flask.

Receiver D is removed, the contents of E added to it, and the titration continued with standard thiosulphate solution to a starch endpoint (titration No. II). This titration figure plus the number of cc. in flask E is then subtracted from the number of cc. of iodine added (50 in this case) and the remainder calculated to sodium sulphide in grams per liter.

The solution is then further titrated with N/10 sodium hydroxide, using methyl orange as the indicator (titration No. III). To this titration, the number of cc. of sodium hydroxide used in titration No. I and the number of cc. of N/10 sodium hydroxide equivalent to the sodium carbonate calculated from the increase in weight of tube H are added. This sum is subtracted from the number of cc. of N/10 acid added (50 cc. in this case) to flask D. The resulting value multiplied by 4 and divided by the volume of the sample (5 cc. in this case) equals the concentration, expressed in grams per liter, of sodium hydroxide in the sample of black liquor.

Example of Calculations

5 cc. sample, 50 cc. N/10 I_2, 50 cc. N/10 H_2SO_4, 10 cc. N/10 $Na_2S_2O_3$ in safety flask.

Na_2CO_3 Weight of ascarite tube:

$62.4710 - 62.4606 = 0.0104$ grams

$.0104 \times 454.5 = 4.73$ cc. N/10 Na_2CO_3

$$\frac{4.73 \times 5.3}{5} = 5.0 \text{ g/l } Na_2CO_3$$

Na_2S

$10 + 15.2 = 25.2$ cc. N/10 $Na_2S_2O_3$ (Titration II)

$50 - 25.2 = 24.8$ cc. N/10 I_2 used

$$\frac{24.8 \times 3.9}{5} = 19.35 \text{ g/l } Na_2S$$

NaOH

Residue in flask (0.8 cc. $\times$ 4 = 3.2 cc. N/10 acid) (Titration I)
Methyl orange endpoint = 21.6 cc. (Titration III)

$21.6 + 3.2 + 4.7 = 29.5$ cc.

$50 - 29.5 = 20.5$ cc. N/10 H_2SO_4 used

$$\frac{20.5 \times 4}{5} = 16.4 \text{ g/l NaOH}$$

Table I shows the results of five analyses of known solutions. In samples 1 and 2 a mixture of sodium hydroxide, sodium sulphide, sodium carbonate, and sodium acetate was analyzed. Acetic acid was left in the distilling flask, but by titrating the residue and making a correction satisfactory results were obtained.

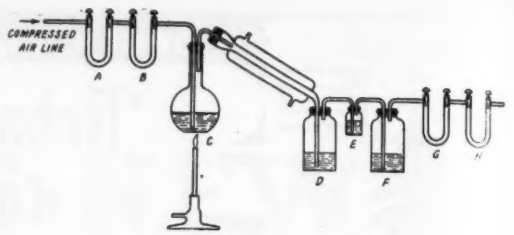

FIG. 1.

Apparatus for the analysis of alkaline cooking and spent liquors by the modified ammonia distillation method. A, dehydrite tube; B, ascarite tube; C, distillation flask; D, receiving flask; E, thiosulphate safety flask; F, conco. H_2SO_4 water trap; G, dehydrite tube; H, ascarite absorption tube.

Analysis of Known Solutions

TABLE I
CHEMICAL ANALYSIS OF A KNOWN SOLUTION CONTAINING MIXTURES OF SODIUM HYDROXIDE, SODIUM CARBONATE, SODIUM SULPHIDE, AND SODIUM ACETATE

Sample No.	Concentration of chemicals in grams per liter: Sodium hydroxide	Sodium sulphide	Sodium carbonate	Found by analysis, grams per liter: Sodium hydroxide	Sodium sulphide	Sodium carbonate
1 [1]	3.9	3.9	5.6	4.0	3.9	5.7
2 [1]	3.9	3.9	5.6	3.9	3.9	5.7
3 [2]	4.4	5.6	5.6	4.3	5.7	5.5
4 [2]	3.9	5.3	5.6	4.0	5.0	5.4
5 [2]	3.9	5.3	5.6	3.7	5.3	5.7

[1] Two-tenths gram of sodium acetate was added in making up the sample.
[2] About 25 cc. of neutralized black liquor residue was added in making up the sample.

In samples 3, 4, and 5, instead of adding sodium acetate about 25 cubic centimeters of neutralized black liquor from a previous black liquor analysis were added. Since the sodium sulphide content of black liquors is known to decrease considerably on standing, this procedure enabled determining whether sodium sulphide was decomposed when the solution was boiled in contact with black liquor. As may be noticed from Table I, no significant decomposition of sodium sulphide took place during the distillation.

Pulping Studies

A series of bomb-scale pulping experiments was made in order to compare the ammonium chloride distillation method *(1)* with the method of analysis now in use at the Forest Products Laboratory *(2)*. The wood used consisted of 25-gram samples of sawdust from Douglas fir. A steel bomb and a thermostatically controlled oil bath, both of which have been previously described *(3)*, were used. The maximum cooking temperature was 170 deg. C. The total cooking period was four hours of which 30 minutes were consumed at the start of each digestion in bringing the contents of the bomb to maximum temperature, where it was held for 3½ hours. The concentration of the cooking liquor was always approximately 60 grams per liter, but since the alkalinity of the liquor was constant for all of the digestions (30 per cent of the weight of wood charged), the volume of the cooking liquor added necessarily varied for each ratio of caustic to sulphide employed.

The cooking liquor was analyzed by both the Forest Products method and the ammonia method. These analyses differ somewhat, principally because the sodium sulphide solution was made up from commercial sodium sulphide and contained a considerable amount of sodium thiosulphate, which is not determined by the ammonia distillation method.

TABLE II.—RESULTS OF THE ANALYSIS OF COOKING AND SPENT LIQUORS OF THE SODA AND SULPHATE PULPING PROCESSES

Digestion number	368		369		374		370		371		372		373	
Ratio of NaOH to Na_2S, per cent	100 per cent NaOH		80-20		75-25		60-40		40-60		20-80		100 per cent Na_2S	
Method of analysis	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation
	1	2		3		4		5		6		7		8
Chemicals in cooking liquor							Grams per liter							
NaOH	60.0	60.0	48.0	47.0	44.8	44.6	36.0	35.1	24.0	23.7	12.0	11.2	0	0
Na_2S	0	0	12.0	11.6	14.8	14.4	24.0	23.7	36.0	34.4	47.9	45.3	61.4	55.7
Na_2CO_3	1.3	.9	....	1.6	....	1.4	....	1.1	....	1.9	....	1.3	....	5.6
Chemicals in black liquor							Grams per liter							
NaOH	....	26.9	....	24.5	....	22.2	....	17.7	....	9.3	....	2.1	....	0
Na_2S	1.7	0	7.7	.6	6.9	4.1	17.6	12.2	29.4	22.6	36.3	32.5	56.4	29.3
NaHS	....	....	....	....	....	....	....	....	....	....	....	....	....	12.6
Na_2CO_3	....	7.3	....	5.7	....	5.6	....	5.3	....	5.1	....	4.6	....	5.6
Free alkali (as NaOH)	21.0	26.9	18.8	24.8	17.2	24.3	17.5	24.0	15.5	20.9	13.3	18.8	10.4	15.0
Difference		5.9		6.0		7.1		6.5		5.4		5.5		4.6
Comparison of the two methods [1]		78.0		75.8		70.4		Per cent 73.0		74.1		70.8		69.3

[1] Ammonia method taken as 100 per cent.

The proportion of sodium hydroxide to sodium sulphide in the cooking liquor was varied from 100 per cent sodium hydroxide to 100 per cent sodium sulphide.

Comparison of Results

Analyses of both the cooking liquors and the corresponding black liquors are given in Table II. In the direct titration (FPL) method, 50 cc. of the liquor are treated with 50 cc. of 10 per cent barium chloride solution in a 500-cc. volumetric flask, diluted to the mark and the precipitate allowed to settle. 50-cc. portions are then titrated to a phenolphthalein endpoint for free alkali and titrated with iodine for the determination of the sodium sulphide content. Sodium carbonate is precipitated by the barium chloride treatment and is not determined. In the results of the ammonia method the calculated free alkali represents sodium hydroxide plus half the sodium sulphide. Sodium carbonate has been disregarded in order to have a direct comparison with the results obtained by the Forest Products Laboratory method and also because sodium carbonate is regarded as ineffective for pulping purposes.

Considering the free alkali determinations, the barium chloride method is consistently low. The difference in grams per liter between the two results shows regularity, the average difference in free alkali content being 5.85 grams per liter for the seven digestions with a range from 4.6 to 7.1. If the deviation is as uniform over a wide variation of free alkali as it is in these experiments, a satisfactory approximation of the free alkali for control work might be obtained by adding a fixed number of grams per liter to the result obtained by the barium chloride method. However, the data obtained here are inadequate to draw any such conclusion. It would seem that such a procedure would be more accurate than a correction based on a certain percentage of error for, as shown in Table II by the row under "Black liquor" titled "Free alkali," this varies over a considerable range in going from 26.9 grams per liter to 15.0 grams per liter of free alkali.

The results for sodium sulphide are always higher by the Forest Products Laboratory method and in addition there is little correlation between the two methods. Apparently some of the sulphur combined with constituents of the wood is still capable of reacting with iodine. In fact, the titration with iodine of the barium chloride treated liquor has long been considered unsatisfactory. In addition to their sulphide content, black liquors always contain organic substances capable of reducing iodine, as is seen in column 2 of Table II. Here a spent liquor from a pure soda digestion shows, upon analysis, 1.7 grams per liter of sodium sulphide. These data show the inadequacy of the Forest Products Laboratory method for the analysis of spent liquors. It is worthy of mention here that the ammoniacal zinc method which has been frequently recommended for black liquor analysis is also unsuited because of the inconvenience encountered in its use.

Changes in the Concentration of Black Liquor As a Result of Storage

An interesting fact brought out in this study was the change in the composition of sulphate black liquor samples on standing in stoppered bottles. The amount of sodium sulphide (which is more or less hydrolyzed into sodium hydrosulphide and sodium hydroxide, depending upon the alkalinity of the liquor) decreases and the amount of sodium hydroxide increases with age, so that in most cases there is only a small change in the free alkali value. That the sulphide content of black liquor changes rapidly on storage has also been noted by Klason *(4)*. Superficially it would appear that sodium hydrosulphide continues to react with the organic constituents of the liquor. That sodium hydrosulphide is further hydrolyzed to hydrogen sulphide and sodium hydroxide, and that hydrogen sulphide is lost either by oxidation or escape into the air does not appear to be borne out by the data obtained in this study since such a reaction should result in a corresponding increase in alkalinity.

Table III shows a comparison between immediate analysis and analysis one week later for all the runs shown in Table II. The soda digestion, No. 368, shows a considerable drop in alkalinity with some increase in sodium carbonate. In the sulphate digestions, No. 371 and No. 373, the alkalinity increased, whereas in No. 372 it decreased. However, the free alkali was never changed more than 3 grams per liter, although the decrease in sulphide and the increase in hydroxide were considerable.

TABLE III.—CHANGE IN SULPHATE SPENT LIQUORS FOR ALL DIGESTIONS OF 30 PER CENT ALKALINITY AFTER STORAGE FOR SEVEN DAYS

Digestion number	368		369		374		370		371		372		373	
Ratio of NaOH to Na_2S, per cent	100 per cent NaOH		80-20		75-25		60-40		40-60		20-80		100 per cent Na_2S	
Time of storage of black liquor, days	Less than 1	7	Less than 1	7	Less than 1	7	Less than 1	7	Less than 1	7	Less than 1	7	Less than 1	7
Chemicals in black liquor							Grams per liter							
Free alkali (as NaOH)	26.9	24.9	24.8	24.7	24.3	22.9	24.0	24.6	20.9	22.4	18.8	15.9	15.0	16.7
NaOH	26.9	24.9	24.5	24.7	22.2	21.5	17.7	21.0	9.3	16.6	2.1	13.7	0	0
Na_2S	0	0	.6	0	4.1	2.7	12.2	7.0	22.6	11.2	32.5	4.3	29.3	32.5
NaHS	....	....	....	....	....	....	....	....	....	....	....	....	12.6	6.6
Na_2CO_3	7.3	8.2	5.7	6.9	5.6	6.2	5.3	5.1	5.1	4.8	4.6	4.6	5.6	5.5

TABLE IV

CHANGE IN SULPHATE SPENT LIQUORS FOR SELECTED DIGESTIONS AFTER STORAGE FOR VARIOUS PERIODS

Time analyzed	At once	1 hour later	7 days later	14 days later
Digestion No. 370—60 per cent NaOH, 40 per cent Na_2S				
Chemicals		Grams per liter		
Free alkali (calculated as NaOH)	24.0	24.3	24.6	....
NaOH	17.6	19.2	21.0	....
Na_2S	12.2	9.9	7.0	....
Na_2CO_3	5.3	5.3	5.1	....
Digestion No. 372—20 per cent NaOH, 80 per cent Na_2S				
Chemicals		Grams per liter		
Free alkali (calculated at NaOH)	18.8	20.0	15.9	10.3
NaOH	2.1	5.2	13.7	9.8
Na_2S	32.5	28.9	4.3	1.0
Na_2CO_3	4.6	4.8	4.6	7.9
Digestion No. 373—100 per cent Na_2S				
Chemicals		Grams per liter		
Free alkali (calculated at NaOH)	15.0	15.6	16.7	19.9
NaOH	0	0	0	4.2
Na_2S	29.3	30.4	32.5	30.7
NaHS	12.6	10.2	6.6	0
Na_2CO_3	5.6	5.6	5.5	5.9

A few of the liquors were analyzed shortly after the digestions were finished and again one hour later. The data in Table IV show the change in composition within that time. These liquors were then analyzed after standing seven days in stoppered bottles, and two of them after standing for a period of fourteen days. As may be noted from Table IV the change in composition is considerable. Apparently the organic compounds continue to decompose and to react with the residual cooking liquor. As might be expected from the complex nature of the solution, and as the data in Tables III and IV show, the change is not always the same nor even in the same direction.

Consumption of Chemicals

The data resulting from the black liquor analyses by the ammonia method were used to calculate the consumption of chemicals in the digestion. The volume of black liquor was assumed to be the same as that of the cooking liquor. The results are shown in Table V.

In pulping, sodium sulphide is considered to be active in the form of its hydrolysis products, sodium hydroxide (free alkali) and sodium hydrosulphide. The percentage of these chemicals, based on the weight of dry wood charged, actually or potentially present has therefore been calculated. The free alkali added was approximately 30 per cent in each case. The sodium hydrogen sulphide ranged from 0 to 39 per cent.

Table V shows that in passing from the pure soda digestion to the pure sulphide digestion the consumption of free alkali decreased from 16.6 per cent to 13.2 per cent. The decrease would probably have been a little less numerically had the free alkali been maintained at exactly 30 per cent throughout, nevertheless, the trend is evident. The sodium hydrogen sulphide consumed gradually increased from 4.4 per cent to 7.8 per cent, the amount of sodium hydrogen sulphide in the cooking liquor being increased about 8 times in this series.

TABLE V

CONSUMPTION OF CHEMICALS IN THE SODA AND SULPHATE PROCESSES (4-HOUR DIGESTIONS, 60 GRAMS PER LITER, 30 PER CENT FREE ALKALI)

Digestion number	368	369	374	370	371	372	373
Ratio of NaOH to Na_2S, per cent	100% NaOH	80-20	75-25	60-40	40-60	20-80	100% Na_2S
Chemicals in cooking liquor			Grams per liter				
Free alkali (as NaOH)	60.0	53.0	52.0	47.3	41.3	34.4	28.6
NaOH	60.0	47.0	44.6	35.1	23.7	11.2	0
Na_2S	0	11.6	14.4	23.7	34.4	45.3	55.7
Na_2CO_3	.9	1.6	1.4	1.1	1.9	1.3	5.6
Chemicals in black liquor			Grams per liter				
Free alkali (as NaOH)	26.9	24.8	24.3	24.0	20.9	18.8	15.0
NaOH	26.9	24.5	22.2	17.7	9.3	2.1	0
Na_2S	26.9	.6	4.1	12.2	22.6	32.5	29.3
NaHS	....	....	....	....	....	....	12.6
jNa_2CO_3	7.3	5.7	5.6	5.3	5.1	4.6	5.6
Calculations based on weight of wood				Per cent			
Free alkali added	30.0	29.3	29.5	29.3	29.2	28.2	27.8
Free alkali consumed	16.6	15.6	15.7	14.4	14.4	12.8	13.2
Free alkali left	13.4	13.7	13.8	14.9	14.8	15.4	14.6
NaHS added	0	4.6	5.9	10.6	17.4	26.6	39.0
NaHS consumed	0	4.4	4.2	5.1	6.0	7.1	7.8
Chemicals (NaOH+NaHS) consumed	16.6	20.0	19.9	19.5	20.4	19.9	21.0
Chemicals as Na_2O consumed	12.9	14.5	14.5	13.4	14.5	13.9	14.5
Yield	41.8	40.5	40.1	40.2	40.9	42.3	43.3

The sum of the percentages of sodium hydroxide and sodium hydrosulphide consumed is almost the same in all the sulphide digestions. When the two chemicals are calculated on an equal basis in terms of sodium oxide consumed the results are even more constant. That is, the black liquor analyses indicate that for a concentration of chemicals of 60 grams per liter, maintained at 30 per cent free alkali, calculated as sodium hydroxide on the weight of wood charged, the total consumption of chemicals is not affected by the ratio of sulphide to hydroxide.

The results for sodium carbonate show that the carbonate formed during the digestion amounts to about 2 or 3 per cent of the weight of wood charged. The amount of carbonate formed in the pure soda digestion was slightly higher than in the sulphide digestions.

The yield of pulp was about the same throughout, being a little higher for the soda digestion and the last two sulphide digestions.

Pulping With 20 Per Cent Free Alkali

In the series of 30 per cent digestions, from 45 to 50 per cent of the free alkali was left in the black liquor. To determine how this excess alkalinity affected pulp yields and chemical consumption, a similar series of experiments was conducted at a lower free alkali and lower total chemical concentration. The concentration of the cooking liquor was set at 40 grams per liter and the volume of liquor used was varied as before in order to provide 20 per cent free alkali on the basis of the weight of wood charged, a value more comparable with commercial conditions than the 30 per cent figure. All other conditions were the same as in the preceding series. The data are given in Table VI.

A comparison of the results of analysis of the black liquor by the two methods supports the conclusions already made on the first series. The free alkali titration by the Forest Products Laboratory method is again low by about 6 grams per liter, except in the two digestions of highest sulphidity. The sodium sulphide determinations by direct treatment with iodine are irregular, as before.

As the higher yields indicate, the pulping action was not so complete in this series as in the 30 per cent free alkali series, and the products obtained were darker in color. There was also a greater variation in color and yield. However, even at 100 per cent sulphidity no burning was apparent. In the digestions where from 20 to 60 per cent sodium sulphide was added the product was fairly uniform, but the last two sulphide digestions (80 to 100 per cent sodium sulphide) were considerably darker and at the same time higher yields were obtained.

The consumption of chemicals was less throughout than in the preceding series, amounting to about 12 per cent as sodium oxide on the weight of wood charged. In the last two digestions, however, the consumption of chemicals increased, but within the range of 20 to 60 per cent sodium sulphide the total consumption of chemicals remained the same with increasing sulphidity as was found in the 30 per cent free alkali series.

The results with 20 per cent free alkali indicate that a surplus of free alkali must be present in the cooking liquor in order to remove efficiently the noncellulosic material from the wood, and that sulphate cooking liquors of a very high proportion of sodium sulphide are not so effective at this alkalinity as liquors containing from 20 to 60 per cent sodium sulphide.

TABLE VI.—CONSUMPTION OF CHEMICALS IN THE SODA AND SULPHATE PROCESSES (4-HOUR DIGESTIONS, 40 GRAMS PER LITER, 20 PER CENT FREE ALKALI)

Digestion number	387		392		388		389		390		393		394	
Ratio of NaOH to Na_2S, per cent	100 per cent NaOH		80-20		70-30		60-40		40-60		20-80		100 per cent Na_2S	
Method of analysis	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation	F.P.L.	Ammonia distillation
							Grams per liter							
Chemicals in cooking liquor														
Free alkali (as NaOH)	39.9	39.4	36.0	35.6	33.6	32.9	33.5	32.6	29.1	29.0	26.7	25.6	21.9	21.2
NaOH	39.9	39.4	31.5	31.2	26.9	27.1	25.0	24.9	16.3	16.7	8.7	9.1	0	1.2
Na_2S	0	0	8.8	8.6	13.1	11.4	16.5	15.1	24.9	24.1	35.0	32.2	42.7	39.1
Na_2CO_3	2.1	1.8	3.2	3.4	.9	3.6	2.8	3.9	4.2	4.8	5.2	7.3	4.9	7.5
							Grams per liter							
Chemicals in black liquor														
Free alkali (as NaOH)	4.4	11.3	5.0	10.7	5.6	11.3	5.5	12.1	5.3	11.6	4.4	6.8	3.1	6.8
NaOH	....	11.3	....	9.7	....	8.7	....	9.5	....	4.0	....	0	....	0
Na_2S	.4	0	5.4	1.9	7.5	5.1	12.7	5.1	22.8	14.9	33.6	13.3	40.0	13.2
NaHS	....	....	....	....	....	....	....	....	....	....	....	9.8	....	12.0
Na_2CO_3	....	7.7	....	6.5	....	7.1	....	7.2	....	8.1	....	9.8	....	9.7
							Per cent							
Calculations based on weight of wood														
Free alkali added	....	19.7	....	19.7	....	20.1	....	20.2	....	20.5	....	21.0	....	20.7
Free alkali consumed	....	14.1	....	13.8	....	13.6	....	12.7	....	12.3	....	15.4	....	14.1
Free alkali left	....	5.6	....	5.9	....	6.5	....	7.5	....	8.2	....	5.6	....	6.6
NaHS added	....	0	....	3.4	....	5.0	....	6.7	....	12.2	....	18.9	....	27.4
NaHS consumed	....	0	....	2.7	....	2.8	....	4.4	....	4.6	....	3.0	....	6.5
Chemicals (NaOH+NaHS) consumed	....	14.1	....	16.5	....	16.4	....	17.1	....	16.9	....	18.4	....	20.6
Chemicals as Na_2O consumed	....	10.9	....	12.2	....	12.1	....	12.3	....	12.1	....	13.6	....	14.5
Yield	....	49.0	....	45.0	....	45.3	....	45.3	....	46.0	....	48.0	....	50.9

In order to apply this work to the determination of the most efficient cooking liquor for the sulphate process, digestions should be made on a larger scale and the physical and chemical properties of the resulting pulps should be investigated.

Kress and McGregor *(5)* have recently published data on the influence of sulphidity in sulphate pulping which indicate incomplete cooking with increasing sulphidity. They, therefore, conclude that substitution of sodium hydroxide by sodium sulphide is restricted to fairly narrow limits. In their work the total chemicals were maintained at 20 per cent of the weight of wood charged, with a constant volume of liquor so that the free alkali ranged from 20 per cent to 10.3 per cent in going from the pure soda digestion to the pure sulphide digestion. It is interesting to note that the pulps became unsatisfactory when the free alkali in the cooking liquor was 14 per cent or less, which is about the percentage of free alkali consumed by the digestion in Table V. The incomplete pulping would then seem to be due to insufficient chemicals and not to inactivity of sodium sulphide (in the form of the hydrolysis products) as a pulping agent.

Summary

1. A method of analysis by distillation with ammonium chloride has been developed at the Forest Products Laboratory and appears to give accurate results with alkaline black liquors.

2. Results by this method have been compared with the standard method in use at the Forest Products Laboratory, on two series of bomb-scale digestions with Douglas fir. In the first series 60 grams of chemicals per liter at 30 per cent free alkali calculated as sodium hydroxide were charged, while in the second 40 grams of chemicals per liter at 20 per cent free alkali were employed. The proportion of sodium sulphide to sodium hydroxide was varied from 0 to 100 per cent.

3. The results by the standard method for free alkali are low and show regularity. The results for sodium sulphide are high and irregular.

4. The black liquors change in composition on standing, the sodium hydroxide content generally increasing at the expense of sodium sulphide.

5. The total consumption of chemicals in sulphate digestions is only slightly affected by the proportion of sodium sulphide to sodium hydroxide employed, where the free alkalinity is maintained constant. This holds throughout in the 30 per cent free alkali series and up to 60 per cent sodium sulphide in the 20 per cent free alkali series. With from 80 to 100 per cent sodium sulphide at 20 per cent free alkali, based on the weight of wood, the consumption of chemicals is definitely higher even though the pulping action is less.

Digestions by the soda process at alkalinities of 20 and 30 per cent consume less chemical than do the sulphate digestions at the same alkalinity.

Literature Cited

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(4) Klason and Seferfelt. Papierfabr. 9, 1093-99 (1911).
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Linen Found in Old Manuscripts

In an effort to determine the relative lasting properties of different types of paper, the United States Bureau of Standards has been analyzing a large and varied collection of specimens.

The permanence of paper, it is pointed out, is obviously a most important factor in connection with Government archives and other records intended for posterity. In examining records found in corner stones of dismantled buildings it has been found that in many cases they are valueless because the paper has crumpled or otherwise deteriorated.

Recently the Government scientists have been examining old manuscripts dating from the year 1,000 to 1749 A.D. These manuscripts composed largely of linen were found to be in good condition, indicating the enduring quality of this fiber. As they originated in Arabia and neighboring countries, they would seem to corroborate the theory that the Arabs used linen largely in the early days of paper making.

The so-called "silk" paper of the Arabs, a thin smooth paper that was held in great esteem, is said to have been made of linen fiber. History records that the Arabs learned paper-making from the Chinese, the originators of paper, through the capture of a number of Chinese paper makers in 704 A.D.

Bulletin, Diescherized Pipe and Tubing

Diescherized Pipe and Tubing is the title of a new bulletin published by The Babcock & Wilcox Tube Company, Beaver Falls, Pa.

This bulletin, the first published on this subject, and arranged for quick, easy reading, contains the more important facts about the Diescher Process and the scratch-free finish and uniform wall thickness of tubes made by that process.

Chemistry of Alkaline Wood Pulp Processes—IV

Is There a Critical Pulping Temperature for the Sulphate Process?*

By J. Stanley Martin[1], Mark W. Bray[2] and C. E. Curran[3]

Abstract

A study has been made to determine the possibility of a critical or optimum temperature of digestion for the sulphate pulping process. In this investigation of critical temperature, twenty-two digestions were made in which the time and temperature of digestion only were varied, all other conditions being maintained as nearly constant as the experimental equipment would allow. For the four temperatures (180, 176, 170 and 160 deg. C.) chosen, which are within the range of commercial practice, no particular optimum or critical temperature which was noticeably beneficial or detrimental to the resulting pulps was found for kraft pulping. There is the possibility, however, that extremely high temperatures or prolonged cooking periods, even within the range of the temperatures chosen, might result in greater differences in pulp characteristics than was found in this investigation; but such conditions could hardly be applied readily or economically with present commercial equipment.

For the several cooking periods chosen, the physical characteristics of the pulps cooked to approximately equal yields under the conditions selected were found to be quite similar, irrespective of the temperature of pulping.

The results of both autoclave and semicommercial pulping experiments in this investigation confirm the findings of previously reported work dealing with the effect of temperature on the velocity of the pulping reaction.

Because of the numerous variables involved in the production of papers from these pulps, but little information was obtained from the papermaking phase of the investigation to establish the possibility of a critical pulping temperature or to serve as a measure of the original characteristics of the pulps. Greater weight is attached to the pulp strength data, which are regarded as sufficient disproof of a critical temperature within the range examined.

Although previous small-scale experiments (*1*) at the Forest Products Laboratory had indicated that digestion temperature mainly affects the speed of pulping, certain differences in the characteristics of commercial pulps, thought to be brought about wholly by a change in cooking temperature, pointed to the possible existence of a critical temperature above or below which unsatisfactory pulps might be obtained. Additional experiments in this connection were therefore undertaken at the suggestion of the Alkaline Pulping Committee of the Technical Association of the Pulp and Paper Industry, to establish if possible the optimum cooking temperature for the sulphate process. Should such a point be found, its determination would not only help to avoid the production of weak or brash pulps, but would also permit the establishment of cooking schedules that would insure pulps of maximum strength from a given species.

In this work the previously reported bomb-scale digestions (*1*), in which sawdust had been used, were supplemented by autoclave experiments using standard pulping chips. These were followed by semicommercial-scale digestions in a 50-pound digester, by means of which sufficient pulp was obtained for testing and for a limited number of papermaking experiments.

Materials

The species of wood selected were second-growth longleaf pine (*2*) (*Pinus palustris*) for the autoclave pulping experiments and second-growth slash pine (*3*) (*Pinus caribaea*) for the semicommercial digestions.

The longleaf pine wood, consisting of butt logs of medium growth rate and of an average age of 28 years, was obtained from Walnut Hill, Escanambia County, Florida. The diameters were fairly uniform, varying from 5.4 to 7.6 inches only.

The slash pine wood was obtained from Cogdell, Ga. Most of it was taken from an even-aged old-field stand, 27 years of age. A small portion, however, was selected from a younger stand, 12 years of age. The average age of the wood was 18.7 years and the bulk of the material was sapwood. Log diameters ranged from 5.6 to 9.4 inches.

Preparation of Materials

Hand-peeled bolts of both longleaf and slash pine were converted into 5/8-inch chips, which were screened and sorted to remove sawdust, slivers, and knots. During the screening operation, chip samples were taken for moisture determinations, so that cooking liquor requirements and pulp yields could be calculated on the basis of oven-dry wood.

Apparatus and Method

Autoclave Experiments

Rotary steam-jacketed autoclaves of 3.7 gallons capacity (approximately 5 pounds of oven-dry longleaf pine chips), were used for the small scale pulping experiments. Indirect steam was used throughout the digestions, so that there was no dilution of the cooking liquor from steam condensation. The digested chips were not "blown," but the content of the digester, after sufficient cooling, was dumped into 70-mesh screen boxes and thoroughly washed with hot water. The washed pulp was passed through a flat screen with "cuts" 0.012 of an inch in width. The screenings were oven-dried and weighed. The screened pulp was pressed to remove some of the water and weighed, and an average sample was taken for the determination of moisture; from these data the yields of screened pulp and of screenings were calculated.

A representative sample of pulp from each digestion was set aside and used for the determination of strength properties by the laboratory standard pebble mill method (*4*).

Semicommercial Experiments

For the semicommercial pulping experiments, supplementing the autoclave studies, a vertical rotary (tumbling type) digester of approximately 100-pounds chip capacity was used. The chips were charged into the digester and the desired volume of cooking liquor added. During the temperature-pressure increase period heating was accomplished by means of the steam jacket of the digester, except that, when necessary, additional steam was admitted

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directly into the cooking liquor at a sufficient rate to keep the temperature rise in line with a previously determined schedule. By this method of heating, excessive steam condensation and liquor dilution are avoided, and the cooking conditions more nearly simulate those in commercial operation. To maintain a temperature and pressure relationship corresponding to conditions of saturated steam, the excess pressure resulting from gases formed during digestion was relieved as necessary. The digester was rotated throughout the cooking period. At the end of the digestion period the content of the digester was blown into a blow pit, where the pulp was thoroughly washed with hot water. The washed pulp was then screened through a 12-cut, 4-plate diaphragm screen and run over a wet machine for the determination of yield.

The pulps were treated in the same manner as the autoclave pulps, but in addition both the bleach requirement (*5*) and the color (*6*) were determined.

Experiments and Results

Autoclave Digestions

In the autoclave digestions all cooking conditions except time of digestion and the particular variable under consideration, temperature, were held constant. Variations in time of digestion were made necessary by the changes in cooking rate and its effect on pulp quality brought about through changes in temperature. Such effects have heretofore been erroneously attributed directly to temperature (assumed to be an independent variable) whereas they are more probably due to the degree of cooking, which is hastened or retarded as the temperature is increased or decreased. In order to secure information on this point, the time of digestion at each of the several temperatures was so varied that properties of pulps of approximately equal yield as well as those cooked for equal time intervals could be compared. For convenience in studying the results of autoclave pulping, the data are shown (Tables I and II) in two ways. In Table I the data are arranged in three series according to the maximum digestion temperature employed, while in Table II pulps of approximately equal yield are grouped together.

The following variations in temperature and time of digestion were made in the three series:

Series 1.—Temperature, 176 deg. C. Digestion periods, ¾, 1, 1½ and 2 hours.

Series 2.—Temperature, 170 deg. C. Digestion periods, 1, 1½, 2 and 3 hours.

Series 3.—Temperature, 160 deg. C. Digestion periods, 2, 3 and 4 hours.

The following cooking conditions were maintained constant for all series:

Pressure increase period, 90 minutes.
Weight of oven-dry wood charged, 5.0 pounds.
Concentration of sodium hydroxide solution, 60 grams per liter.
Concentration of sodium sulphide solution, 30 grams per liter.
Total concentration of chemical in the cooking liquor, 90 grams per liter.
Sodium hydroxide charged per hundred pounds of oven-dry wood, 15.0 pounds.
Sodium sulphide charged per hundred pounds of oven-dry wood, 7.5 pounds.
Total chemical charged per hundred pounds of oven-dry wood, 22.5 pounds.
Ratio of sodium hydroxide to sodium sulphide charged, 2:1.
Total volume of liquor per hundred pounds of oven-dry wood, 30 gallons.

Discussion of Results (Autoclave Cooks)

Series 1. The pulps from this series show variations in yield and strength as a result of pulping at a temperature of 176 deg. C. for ¾, 1, 1½, and 2 hours, respectively. With this variation in time of digestion, the yield decreased from 44.4 to 41.1 per cent; the maximum bursting strength values decreased from 1.11 to 1.01 points; and, in addition, the tear and double fold values decreased. The tensile strength increased up to 4,953 meters for 1½ hours digestion, but in the 2-hour digestion it decreased to 4,164 meters.

Series 2. In this series, at 170 deg. C., the tendency toward decrease in yield and strength with increase in cooking time is again very marked. For a given time of digestion, however, the yield figures for this series are slightly higher than those in *Series 1.*

Series 3. In pulping at 160 deg. C., an increase in the cooking time makes only a small change in the bursting strength values, but there is a substantial improvement in the tearing qualities of the pulps. The folding endurance and tensile strength showed no definite trend in this series, although the values are of a slightly higher magnitude than for either *Series 1* or *Series 2.*

Although the differences in most cases were not great, a general comparison of yield and strength values for the pulps in the three series shows the lowest values throughout for the 176 deg. C. digestions, the highest values for the 160 deg. C. digestions, and intermediate values for

TABLE I.—DIGESTION TEMPERATURE AND ITS EFFECT ON THE YIELD AND THE PHYSICAL PROPERTIES OF PULPS MADE FROM LONGLEAF PINE BY THE SULPHATE PROCESS

(All other conditions [1] except time of digestion maintained constant)
Data arranged according to digestion temperature.

Digestion No.	Cooking data: Duration at maximum temperature, hours	Cooking data: Temperature of pulping, deg. C.	Yield: Screenings, per cent	Yield: Screened pulp, per cent	Yield: Total, per cent	Bursting strength: 40 minutes	Bursting strength: 80 minutes	Bursting strength: 120 minutes	Bursting strength: 160 minutes	Tearing strength: 40 minutes	Tearing strength: 80 minutes	Tearing strength: 120 minutes	Tearing strength: 160 minutes	Folding endurance: 40 minutes	Folding endurance: 80 minutes	Folding endurance: 120 minutes	Folding endurance: 160 minutes	Tensile strength: 40 minutes	Tensile strength: 80 minutes	Tensile strength: 120 minutes	Tensile strength: 160 minutes	Average stretch: 40 minutes	Average stretch: 80 minutes	Average stretch: 120 minutes	Average stretch: 160 minutes
						Points/pound/ream				Grams/pound/ream				Double folds				Meters breaking length				Per cent			
SERIES 1																									
A-114	¾	176	0.66	43.74	44.40	0.57	0.98	1.11	1.02	3.35	3.68	3.19	2.80	55	455	1005	1186	2940	4000	4235	4380	9.00	11.25	14.00	19.25
A-95	1	176	.57	43.53	44.10	.64	1.06	1.03	.92	2.78	2.95	2.62	2.35	57	550	857	550	3240	4514	4792	4031	7.00	10.37	15.12	9.37
A-96	1½	176	.51	41.82	42.33	.71	.96	1.01	.89	3.16	2.97	2.60	1.95	83	682	648	535	2832	4953	4456	3539	8.12	10.75	11.87	7.87
A-97	2	176	.52	40.58	41.10	.70	1.06	.99	.78	2.68	2.57	2.31	1.89	183	644	378	257	3843	4164	3952	3447	9.87	13.25	12.50	8.37
SERIES 2																									
A-104	1	170	1.47	44.63	46.10	.60	.93	1.16	1.07	3.12	3.82	3.06	2.80	32	449	905	652	2840	3900	4610	3735	6.75	7.75	12.62	14.50
A-115	1½	170	.55	43.25	43.80	.63	1.02	1.09	1.01	3.42	3.72	2.98	2.70	85	775	1152	593	2550	3585	3912	4400	11.00	13.75	14.50	15.75
A-105	2	170	.73	42.30	43.03	.68	.95	1.08	.91	3.14	3.35	2.95	2.60	107	728	608	534	3785	4100	4655	4225	10.00	12.00	13.25	16.00
A-116	3	170	.37	41.23	41.60	.60	.90	1.04	.83	3.23	3.27	3.08	2.44	94	433	224	526	2972	3837	4075	3340	10.50	12.00	16.00	11.37
SERIES 3																									
A-107	2	160	.24	45.26	45.50	.56	1.00	1.15	1.16	3.55	3.84	3.31	3.29	45	1440	821	1410	3060	6440	5010	4730	7.75	12.75	12.50	10.75
A-108	3	160	.38	43.62	44.00	.63	1.01	1.10	1.00	3.81	3.78	3.55	2.62	83	573	786	650	3298	3575	4910	3940	7.75	10.50	11.50	13.25
A-109	4	160	.26	43.44	43.70	.55	1.01	1.01	1.03	4.30	3.53	3.24	2.63	349	1348	1316	1174	3412	3975	4650	5445	9.50	9.50	17.25	15.50

[1] The cooking conditions used for all digestions were as follows: Pressure increase period—90 minutes; Weight of oven-dry wood charged—5.00 pounds; Concentration of sodium hydroxide solution—60 grams per liter; Concentration of sodium sulphide solution—30 grams per liter; Total concentration of chemical in cooking liquor—90 grams per liter; Sodium hydroxide charged per hundred pounds of oven-dry wood—15.0 pounds; Sodium sulphide charged per hundred pounds of oven-dry wood—7.5 pounds; Total chemical charged per hundred pounds oven-dry wood—22.5 pounds; Ratio of sodium hydroxide to sodium sulphide charged—2:1; Total volume of liquor per hundred pounds of oven-dry wood—30 gallons.

[2] Pebble milling conditions: Consistency—4.3 per cent; R.P.M.—60. Tests made at 65 per cent relative humidity and 72 deg. F.

TABLE II.—DIGESTION TEMPERATURE AND ITS EFFECT ON THE YIELD AND THE PHYSICAL PROPERTIES OF PULPS MADE FROM LONGLEAF PINE BY THE SULPHATE PROCESS

(All other conditions[1] except time of digestion maintained constant)
Data grouped according to similar yields.

Digestion No.	Cooking data: Duration at maximum temperature, hours	Cooking data: Temperature of pulping, deg. C.	Yield: Screenings, per cent	Yield: Screened pulp, per cent	Yield: Total, per cent	Strength data of pulps processed in the pebble mill[2]: Bursting strength, Points/pound/ream: 40 minutes	80 minutes	120 minutes	160 minutes	Tearing strength, Grams/pound/ream: 40 minutes	80 minutes	120 minutes	160 minutes	Folding endurance, Double folds: 40 minutes	80 minutes	120 minutes	160 minutes	Tensile strength, Meters breaking length: 40 minutes	80 minutes	120 minutes	160 minutes	Average stretch, Per cent: 40 minutes	80 minutes	120 minutes	160 minutes
A-114	¾	176	0.66	43.74	44.40	0.57	0.98	1.11	1.02	3.35	3.68	3.19	2.80	55	455	1305	1186	2940	4000	4235	4380	9.00	11.25	14.00	19.25
A-95	1	176	.57	43.53	44.10	.64	1.06	1.03	.92	2.78	2.95	2.62	2.35	57	550	857	550	3240	4514	4792	4031	7.00	10.37	15.12	9.37
A-115	1½	170	.55	43.25	43.80	.63	1.02	1.09	1.01	3.42	3.72	2.98	2.70	85	775	1152	593	2550	3585	3912	4400	11.00	13.75	14.50	15.75
A-108	3	160	.38	43.62	44.00	.63	1.01	1.10	1.00	3.81	3.78	3.55	2.62	83	573	786	650	3298	3575	4910	3940	7.75	10.50	11.50	13.25
A-109	4	160	.26	43.44	43.70	.55	1.01	1.01	1.03	4.30	3.53	3.24	2.63	349	1348	1316	1174	3412	3975	4650	5445	9.50	9.50	17.25	15.50
A-96	1½	176	.51	41.82	42.33	.71	.96	1.01	.89	3.16	2.97	2.60	1.95	88	682	648	535	2832	4953	4456	3539	8.12	10.75	11.87	7.87
A-97	2	176	.52	40.58	41.10	.70	1.06	.99	.78	2.68	2.57	2.31	1.89	183	644	378	257	3843	4164	3952	3447	9.87	13.25	12.50	8.37
A-116	3	170	.37	41.23	41.60	.60	.90	1.04	.83	3.23	3.27	3.08	2.44	94	433	224	526	2972	3837	4075	3340	10.50	12.00	16.00	11.37
A-104	1	170	1.47	44.63	46.10	.60	.93	1.16	1.07	3.12	3.82	3.06	2.80	32	449	905	652	2840	3900	4610	3735	6.75	7.75	12.62	14.50
A-107	2	160	.24	45.26	45.50	.56	1.00	1.15	1.16	3.55	3.84	3.31	3.29	45	1440	821	1410	3060	6440	5010	4730	7.75	12.75	12.50	10.75

[1] The cooking conditions used for all digestions were as follows: Pressure increase period—90 minutes; Weight of oven-dry wood charged—5.00 pounds; Concentration of sodium hydroxide solution—60 grams per liter; Concentration of sodium sulphide solution—30 grams per liter; Total concentration of chemical in cooking liquor—90 grams per liter; Sodium hydroxide charged per hundred pounds of oven-dry wood—15.0 pounds; Sodium sulphide charged per hundred pounds of oven-dry wood—7.5 pounds; Total chemical charged per hundred pounds oven-dry wood—22.5 pounds; Ratio of sodium hydroxide to sodium sulphide charged—2:1; Total volume of liquor per hundred pounds of oven-dry wood—30 gallons.
[2] Pebble milling conditions: Consistency—4.3 per cent; R.P.M.—60. Tests made at 65 per cent relative humidity and 72 deg. F.

the 170 deg. C. digestions, thus confirming the conclusions of the previous work (*1*) that the only significant effect of an increase in temperature is to accelerate the speed of digestion. As is shown later, this relationship did not appear clearly in all of the semicommercial digestions, where the condensation of steam in the cooking liquor may have been a factor.

In Table II, where the eleven digestions are regrouped according to equality of yields, the data show plainly that, within the limits of the cooking conditions chosen, pulps cooked to an equal yield have similar physical properties as judged by strength values. While some of the strength values do not check exactly, most of them are in close agreement, irrespective of the temperature or time of pulping, when the pulps are considered on a basis of equal yields.

Semicommercial-Scale Digestions

In the semicommercial experiments, also, all conditions except the temperature and the time of digestion were maintained the same. The maximum digestion temperatures were 180, 170, and 160 deg. C. In a manner similar to that of the autoclave pulping experiments, the time at maximum temperature was varied according to the following program:

Series 1.—For temperature 180 deg. C., the time of digestion at maximum temperature was ½, 1, and 1½ hours.
Series 2.—For temperature 170 deg. C., time at maximum temperature was 1, 1½, 2, and 3 hours.
Series 3.—For temperature 160 deg. C., time at maximum temperature was 1½, 2, 3, and 4 hours.

With the exception that the weight of oven-dry wood charged per digester was 100 pounds, the other cooking conditions for the eleven semicommercial digestions were essentially the same as those for the autoclave digestions.

This yield, bleach requirement, and strength data for the pulps obtained are recorded in Table III.

Discussion of Results (Semicommercial cooks)

Series 1.—The three digestions of this series show the variations as a result of cooking at the maximum temperature of 180 deg. C. for ½, 1, and 1½ hours. The ½-hour digestion gave a screened pulp yield of 45.0 per cent, as compared with 43.7 per cent for the 1½ hour digestion. In the case of the intermediate one-hour digestion, both yield and bleaching characteristics were out of line owing to difficulties encountered in following the predetermined cooking schedules; but, even so, the values do not indicate any significant effect of temperature. The bursting and tearing strengths, however, show definite trends by a reduction in both factors as the cooking time at maximum temperature was increased. Lengthened time of cooking likewise decreased the folding endurance, but the breaking length values showed an unexplained but not important increase.

Series 2.—In this series also, four digestions at 170 deg. C. in which the cooking time at maximum temperature was 1, 1½, 2, and 3 hours, respectively, increasing the cooking time lowered the yield of screened pulp. Considering the 25 per cent bleaching powder treatment, very little difference in the color readings was shown for the first three digestions, but the three-hour digestion yielded an easier bleaching pulp.

As in *Series 1*, the bursting strength decreased with increase in digestion time, the values dropping from 1.07 points per pound per ream for one hour of cooking to 0.92 for the three-hour digestion. The maximum tearing strength showed a slight increase for the first three digestions and then decreased. Tensile strength showed the opposite tendency in comparison with the tear values, decreasing for the first three digestions, and then increasing again for the three-hour digestion; however, the value reached in one hour of digestion was not again attained. The folding endurance values decreased from 1088 to 816 double folds as time of cooking at maximum temperature was increased from one hour to three hours.

Series 3.—Four digestions were made at 160 deg. C., with time at maximum temperature 1½, 2, 3, and 4 hours respectively. The yield values for this series showed considerable and unexpected variations which are difficult to explain. The 4-hour digestion gave a higher yield of screened pulp (48.1 per cent) than the 1½ hour digestion (46.2 per cent). Even though yields varied from expected values, the bleach requirement tests show that the pulps bleached easier as the time of cooking was increased.

The bursting strength of the pulps increased for the first three digestions to a maximum value for the series of 1.08 points per pound per ream, while for the last digestion the maximum value was only 1.01 points. The tearing strengths were about equivalent for all the pulps in the series (3.61 points for both the 2 and the 4-hour periods). The general tendency of the folding endurance

data was to increase in number of double folds as time of cooking increased. The tensile strength increased from 3562 to 4430 meters for the first three digestions and then decreased again to 4145 meters for the last digestion in the series.

A further comparison may be made by grouping the 1½ hour digestions from all three series. Thus for the same cooking time at maximum temperature, comparison of the physical properties of the pulps may be made for the three temperatures, 180, 170, and 160 deg. C. The decrease in temperature resulted in a progressive increase in yield (43.7, 45.5 and 46.2 per cent) of screened pulp. These results would be expected, since cooking at lower temperatures is less drastic and therefore dissolved less material.

Since the bursting strength values, 0.97, 1.01 and 0.96 points for the 180, 170 and 160 deg. C. digestions, respectively, are all within the experimental error of the method of determination, no special significance need be attributed to the differences observed. The tearing strength of the three pulps likewise shows minimal variation. On the other hand, the folding endurance of the pulps decreased from a maximum of 1,015 to a minimum of 816 double folds as the temperature decreased. The tensile strength decreased slightly from 180 to 170 deg. C. (4,525 to 4,425 meters), and then dropped sharply to a value of 3,562 for the 160 deg. C. digestion.

Color readings, made on sheets bleached with 25 per cent of bleaching powder, indicated that the more drastic cooking at the higher temperatures produced easier bleaching pulps.

TABLE III.—DIGESTION TEMPERATURE AND ITS EFFECT ON THE YIELD AND PHYSICAL PROPERTIES OF PULPS AND PAPERS MADE FROM SLASH PINE BY THE SULPHATE PROCESS

Cooking data[1]						Test of bleach requirement				Strength data of pulps processed in pebble mill[2] (Tests made at 72° F. and 65 per cent relative humidity)						Paper machine and strength data of papers									
			Yield			Ives color readings																			
Digestion No.	Duration at maximum temperature Hours	Temperature of pulping deg. C.	Oven-dry screened pulp, per cent	Oven-dry screenings per cent	Total, per cent	Standard bleaching powder added to pulp	Red	Green	Blue	Time in Pebble mill, minutes	Bursting strength, Pts./lb./ream	Tearing strength, Gms./lb./ream	Folding endurance, Double folds	Tensile strength (Breaking length), Meters	Stretch, per cent	Machine run, No.	Beating time, Min.	Type of paper	Sizing material added to fiber	Ream weight (24x36-500), Pounds	Bursting strength, Pts./lb./ream	Tearing strength, Gms./lb./ream	Double folds	Tensile strength (Breaking length), Meters	Stretch, Per cent
2310	0.5	180	45.0	0.3	45.3	0	46	35	30	40	0.51	3.65	91	2777	11.50	308	90	Waterleaf							
						25	90	88	75	80	.86	3.69	746	3141	10.75	309	150	Wrapper	Rosin	50.0	0.65	2.32	684	4830	3.85
						30	91	86	78	120	.99	3.35	1125	3967	14.25										
										160	1.02	2.98	1377	4393	16.50										
										200	.96	2.59	1745	3541	14.50										
2308	1	180	42.0	.6	42.6	0	43	32	27	40	.60	3.15	134	2711	8.00	304	90	Waterleaf							
						25	86	78	69	80	.83	3.56	566	5067	10.50	305	150	Wrapper	Rosin	54.0	.75	2.44	1043	5501	4.20
						30	87	80	74	120	.98	3.22	585	4217	14.25										
										160	.95	2.90	879	4325	13.25										
										200	.89	2.43	852	4307	10.75										
2309	1.5	180	43.7	.4	44.1	0	43	33	28	40	.54	3.05	82	3008	10.25	306	90	Waterleaf							
						25	89	82	74	80	.85	3.21	494	3811	10.50	307	150	Wrapper	Rosin	47.0	.72	2.83	623	6017	3.70
						30	89	83	77	120	.97	3.14	581	4520	12.50										
										160	.95	2.69	813	4045	11.75										
										200	.87	2.24	1015	3659	8.25										
2307	1	170	45.5	.7	46.2	0	44	32	27	40	.50	2.96	35	2686	9.00	302	90	Waterleaf							
						25	86	78	67	80	.85	3.25	321	3834	10.00	303	150	Wrapper	Rosin	47.0	.95	2.37	880	6235	4.80
						30	87	82	76	120	1.02	3.31	1021	4652	14.75										
										160	1.07	2.89	763	4679	14.25										
										200	.99	2.72	1088	4212	14.50										
2305	1.5	170	45.5	.2	45.7	0	43	32	28	40	.57	3.32	43	2925	7.50	298	90	Waterleaf							
						25	85	78	66	80	.94	3.49	621	3920	13.00	299	135	Wrapper	.....	52.0	.76	1.82	652	5592	7.90
						30	87	85	78	120	1.01	3.31	348	4425	14.25										
										160	.99	2.62	961	3880	14.00										
										200	.97	2.31	718	4350	12.50										
2304	2	170	44.7	.3	45.0	0	42	32	27	40	.49	3.06	29	2811	6.50	295	90	Waterleaf							
						25	83	76	67	80	.87	3.64	409	3396	12.50	296	155	Wrapper	.....	49.0	.80	2.33	1056	5959	7.20
						30	86	80	71	120	.99	3.28	830	3871	13.00										
										160	.94	2.94	816	4200	14.25										
										200	.86	2.66	896	3435	14.50										
2306	3	170	42.1	.2	42.3	0	42	31	27	40	.49	3.20	47	2797	6.25	300	90	Waterleaf							
						25	85	80	73	80	.79	3.48	428	3350	9.00	301	145	Wrapper	.....	51.0	.76	2.32	1175	5435	4.12
						30	90	84	81	120	.87	2.92	583	4030	11.00										
										160	.92	2.78	816	4577	14.50										
										200	.83	2.35	426	4555	12.75										
2314	1.5	160	46.2	.2	46.4	0	46	36	30	40	.44	3.28	33	2531	8.25	327	75	Waterleaf							
						25	79	66	56	80	.77	3.23	201	3228	10.50	328	150	Wrapper	Rosin	55.0	.60	2.16	331	4960	3.40
						30	84	74	64	120	.89	3.23	294	3545	15.00										
										160	.96	2.89	633	3530	15.25										
										200	.93	2.76	831	3562	19.25										
2312	2	160	47.4	.3	47.7	0	40	31	26	40	.48	3.24	46	2387	7.75	316	90	Waterleaf							
						25	71	62	49	80	.84	3.61	342	3957	11.00	317	165	Wrapper	Rosin	52.0	.68	2.30	508	4982	8.20
						30	83	72	59	120	.99	3.47	640	3860	14.25										
										160	1.03	2.98	793	4292	13.75										
										200	1.00	3.08	535	4245	14.50										
2311	3	160	46.7	.1	46.8	0	46	34	29	40	.54	2.71	53	2837	6.62	314	90	Waterleaf							
						25	86	76	68	80	.87	3.22	622	3907	8.25	315	165	Wrapper	Rosin	51.0	.69	2.26	665	5320	7.30
						30	90	84	76	120	.99	3.45	749	4295	14.00										
										160	1.08	3.07	1010	4430	13.25										
										200	1.00	2.82	1053	4057	11.12										
2313	4	160	48.0	.1	48.1	0	..	..	..	40	.55	3.61	161	3035	9.25	318	75	Waterleaf							
						25	85	85	74	80	.92	3.43	942	3695	12.87	319	135	Wrapper	Rosin	50.0	.71	2.58	647	5395	8.50
						30	85	86	79	120	1.01	3.32	1263	4065	15.12										
										160	1.00	3.00	774	4145	17.37										
										200	.87	2.65	708	3825	13.75										

[1] See text for complete description of all other cooking conditions, which were the same for all digestions.
[2] Pebble milling conditions: Consistence 4.3 per cent, R.p.m. 60.
U. S. Forest Products Laboratory, Project 1168-5. Problems A-130 and A-134.

In general, however, the data show no marked differences of values resulting from changes in cooking temperature. For example, the highest bursting value for any of the 180 deg. C. digestions was 1.02 points, while for the 170 deg. C. digestions 1.07 points and for the 160 deg. C. digestions 1.08 points were obtained. Considered in the same order, the lowest bursting values were 0.97, 0.92, and 0.96 points. Such comparatively small differences resulting either from the temperature employed or the time of cooking at these temperatures offer little argument for a critical or optimum cooking temperature within the range commonly employed in commercial operations.

Paper Machine Experiments

Two paper machine runs were made on the pulp from each of the large-scale digestions. In the first run waterleaf paper was made, without the addition of other materials such as size or alum, so that samples similar to the pulps could be obtained. The pulps for these papers were partially beaten for a period of 90 minutes in order to obtain better sheet formation on the paper machine. The rest of the pulp from each digestion was run over the paper machine as wrapping paper.

Consideration of these data develops that the papers from the 170 degrees series of pulps are consistently higher in test value than those from pulps of the other temperature series, and should ostensibly be the basis of concluding that this favorable showing is the result of a temperature effect. The authors do not, however, consider that the existence of any critical pulping temperature has been established by the paper strength data, for the following reasons:

As the pulps were not in every case given the same degree of cooking, varying beating and jordaning procedures were necessary to get a satisfactory sheet over the machine. While the treatment accorded each pulp was, so far as possible, made appropriate to that particular pulp on the basis of its pebble mill test and other characteristics, there are nevertheless numerous variables of which there is little knowledge or means of control. This is particularly true where only a small amount of stock is available and there is no opportunity to adjust machine conditions to give optimum results.

Admitting that the properties of the finished sheet are of paramount importance, the influence of the variables of machine operation in these runs must be recognized. The pebble mill test method, on the contrary, seems to be a much more reproducible means of determining comparative quality. In this test, at least, the processing and sheet forming operations are strictly standardized. Any differences exhibited by a given pulp must be due to the characteristics of the pulp, rather than to the treatment which it has received. It therefore seems logical, in case of conflicting results, to base conclusions upon the pebble mill data rather than on the behavior of machine-made sheets.

Summary and Conclusions

In the autoclave pulping experiments an increase in cooking time for any of the temperatures employed resulted in a decrease in yield and in strength values, with the exception of the resistance to tear for the pulps made at 160 deg. C. Pulps cooked for the same length of time at various temperatures showed the higher yields for the lower temperatures.

The semicommercial-scale pulping experiments showed that increasing the cooking time at 180 and 170 deg. C., caused a small decrease in yield and in strength properties. The 160 deg. C. pulping showed a small increase in pulp yield as the time of cooking was increased. As a rule the strength values increased to a maximum under these conditions and then decreased again. Increasing the cooking time resulted in easier bleaching for pulps in the 160 deg. C. series, whereas but little change in the bleach requirements for the 170 and 180 deg. C. digestions was observed. A comparison of the effect of temperature of pulping indicates higher tear and double folds for the 180 deg. C. digestions in comparison with those made at the lower temperatures, while yields for a given time of digestion were higher in the 160 deg. C. series. Nevertheless, considering all the characteristics involved, and the magnitude of variations, the 170 deg. C. pulps are regarded fully as satisfactory as those produced at either 160 or 180 deg. C. The 180 and 170 deg. C. pulps seemed to hydrate more rapidly than those prepared at 160 deg. C.

Literature Cited

[1] Bray, M. W., Paper Trade J. 87, no. 23:64 (Dec. 6, 1928).
[2] Bray and Paul, Southern Lumberman, 141, No. 1793:163 (Dec. 15, 1930).
[3] Curran, C. E., Pulpwood 5, No. 3:5 (March 1932). Martin and Bray, Forest Products Laboratory Problem A-133, Evaluation of Slash Pine Pulpwood, Shipment 1335 (unpublished).
[4] Method No. 101, Manual of Standard Testing Methods for Pulpwood, Pulp, Stuff and Paper, Forest Products Laboratory (June 22, 1928).
[5] Method No. 49 (Forest Products Laboratory Manual).
[6] Baird, P. K., Paper Trade J. 84, No. 17:48 (1927).

The Power Age

Walter N. Polakov who was a speaker at the annual luncheon of the Technical Association of the Pulp and Paper Industry in 1932, and is now an engineer advisor in the Tennessee Valley Authority, has just written a book that has had a large public reception. It is entitled, "The Power Age" and is published by Covici-Friede, 386 Fourth avenue, New York, and is available at $2 per copy.

In this book Mr. Polakov points out that we have just emerged from the machine age and are entering a new era—the power age. The problem to be solved is not technological unemployment but its exact opposite, the employment of technology.

Outstanding among the recent ideas fostered by the characteristics of the power age is the thought that national economy can be planned, although conducted on a competitive basis. As an alternative to government control the "self government" of industrial groups was proposed. The times demand an "engineering statesmanship" which "will guide itself and the affairs of state in scientific light by scientific means."

The immediate task is to learn the technique of marshaling facts, of actually presenting the data of what is in relation to what may be and what should be. Then by removing the obstacles thus disclosed, it will be possible to coordinate the economic fundamentals: production and consumption. Today our government begins to recognize the true nature of our power age civilization. The N.R.A. tacitly admits its technological and industrial base, its new economic foundation and the urgency of providing economic security for the whole of society. We must employ scientific intelligence and all available engineering means lest we perish together with the defunct machine age and its Faustian culture.

Delaware TAPPI to Discuss Beating

The next meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry will be held at the Engineers Club, 1317 Spruce street, Philadelphia, Friday evening, November 24th at 6:30 P. M.

James d'A. Clark, technical director of the Scott Paper Company, Chester, Pa., will talk on "The Modern Views on Hydration."

James Coghill, research director of the Noble and Wood Machine Company, Hoosick Falls, N. Y., will discuss "The Problem of Beating."

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Power House

Steam Turbine Plants in The Paper Industry. Samuel M. Green. Paper Trade J. 96, No. 9: 40-42 (March 2, 1933).—Methods are indicated that may be used to reduce the cost of power in the paper industry; no recommendations can be made that will apply to all cases, as each particular case must be studied and solved on its own merits.—A. P.-C.

Surplus Power in the Pulp and Paper Industry. A. G. Christie. Paper Trade J. 96, No. 9: 34-36 (March 2, 1933).—A discussion indicating the availability of certain possible supplies of surplus power both in industrial and in utility plants.—A. P.-C.

Acid Resisting Steels in the Sulphite Industry. C. M. Carmichael and G. S. Shaw. Pulp Paper Can. 34: 177-186, 208 (Feb., 1933).—After briefly explaining the essential principles of the metallurgy of acid resisting steels of the 18-8 type, numerous examples are given (illustrated by means of microphotographs) and explained of parts that failed and parts that did not fail in sulphite mills.—A. P.-C.

Progress in the Production and Transmission of Heat and Power. A. G. Darling et al. Paper Trade J. 96, No. 7: 59-107 (Feb. 16, 1933).—A review of recent developments in steam generation, steam distribution, steam power, hydraulic power, oil engines, generation and distribution of electricity.—A. P.-C.

The Progress in Steam and Power Economy for the Year 1932. K. Weiss, Erfurt. Zellstoff Papier, 13, No. 1: 12-17 (Jan., 1933).—A great number of improvements and nuances are described.—J. F. O.

Removal of Particles from Flue Gases. H. G. Klein. Zellstoff Papier, 12, No. 12: 498-500 (Dec., 1932).—By means of numerous drawings, the different ways of removing the particles from flue gases are discussed.—J. F. O.

Paper Specialties

Building Board. Rakennusosakeyhtio P. Brandt Byggnadsaktiebolag, Helsingfors. Finn. pat. 14,490 (May 11, 1931).—A mat of straw or similar material, is covered on one or both sides with a surface of wood stock.—J. F. O.

Process for the Manufacture of Formed, Water-Proof Objects of Fiberous Materials. Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij, Hague, Netherlands. Finn. pat. 14,535 (July 28, 1930).—An emulsified, water repelling substance is precipitated on the fiber by a fixing material which has a pH in an aqueous mixture corresponding to the isoelectric point of the fixation substance.—J. F. O.

Process and Arrangement for the Automatic Weighing of Continuously Transported Materials. Osakeyhtio Toledo A. Bol., Helsingfors. Finn. pat. 14,495 (March 7, 1931).—J. F. O.

Process for the Manufacture of an Asbestos Cement Sheet or Asbestos Cement Corrugated Board, with a Wire Netting Imbedded Therein. A. H. Arentsen, Amsterdam. Finn. pat. 14,575 (May 10, 1930).—J. F. O.

Process and Apparatus for the Manufacture of Asbestos Cement Tubes. Eternit Pietra Artificiale Soc. An., Genoa, Italy. Nor. pat. 51,088 (Feb. 20, 1931)—J. F. O.

Process for the Manufacture of a Fire-Proof and Insulating Building Material. A. B. Hansen, Oslo. Swed. pat. 74,380 (Sept. 18, 1930).—Ground wood, pulp, wood waste, fibers from sugar cane and similar materials can be used as raw material. These materials are drenched in a solution of alkali silicate and the silicic acid is precipitated with hydrochloric acid, and then the fiberous material is made into forms.—J. F. O.

Process for the Treatment of Sheets of Carbon Paper. Kurt Hoinkis, Berlin. Ger. pat. 567,411 (March 25, 1931).—In order to prevent certain parts of the carbon paper from registering, these parts are covered with solutions of cellulose esters or mixtures of the same and drenched with rosin.—J. F. O.

Process for the Manufacture of Paper, Board, Plastic Masses, Floor Coverings and Similar Materials with Water, Light Fast and Resistant to Rubbing Mottled Fibers. I. G. Farbenindustrie A. G., Frankfurt, a. M. Ger. pat. 567,238 (Oct. 30, 1930).—Organic solvents of cellulose derivatives are used.—J. F. O.

Process and Arrangement for the Production of Disks and Similar Objects from Ground Wood, for Beer Plates, Coverings, Packing, etc. Max Issleiber, Weissenbach. Ger. pat. 566,556 (Nov. 12, 1931).—J. F. O.

Process for Making Combustible Materials Fire-Proof. I. G. Farbenindustrie Akt. Ges., Frankfurt a.M. Ger. pat. 566,278 (May 9, 1929).—Webs of jute, cotton, silk, paper or similar combustible materials are drenched with a halogenated aliphatic ester of phosphoric acid, for example, tri-chlor ethyl phosphite, and then freed from the excess by centrifuging.—J. F. O.

Process for the Manufacture of Carton and Board of Various Strengths. Alois Purkert, Teplitz. Czech. pat. 40,766.—J. F. O.

Process for Applying the Carbon Color to Paper. Transkrit Aktiengesellschaft, Zurich, Switzerland. Czech. pat. 40,191.—J. F. O.

Process for the Manufacture of Objects Provided with Corrugations, Out of Board, Carton, Pulp Ground Wood and Similar Materials. And. B. Hansen, Oslo. Nor. pat. 51,318 (March 9, 1932).—J. F. O.

Process for Making Paper and Board Impervious By Impregnation. Papeteries Navarre Societe, Lyon France. Nor. pat. 51,359 (Feb. 5, 1931).—A solution is used containing the following ingredients (a) alkali caseinate, (b) a quantity of formaldehyde at least sufficient to completely coagulate the caseinate, and (c) a volatile material, preferable ammonia, which can hinder the coagulation so that this takes place immediately after the impregnation.—J. F. O.

Printing of Illustrations and the Quality of the Paper. Julius Bekk, Ullstein Drukerei, Berlin. Zellstoff Papier, 12, No. 10: 399-403; No. 11: 441-47; No. 12: 489-493; 13, No. 1: 18-22 (Oct., 1932—Jan., 1933).—Curves are drawn showing the relation between the percentage

blackness and the grams of ink per square meter for various printing papers. The factors which influence the amount of ink required are discussed, such as the surface and the kind and particle size of the paper filler. That the wire side of the sheet requires less ink than the top side even though the top side is smoother is explained by the influence of the filler. In general, an increase in smoothness means a lowering of ink absorption. The relative humidity is a very important factor in the printing for the drying of the ink.—J. F. O.

Permanence of Commercial Record Papers: A Study. Jessie E. Minor. Research Lab. Record 2, No. 1: 23-26 (1932).—Twelve samples of representative rag, alpha, and sulphite papers were aged for from 3 to 30 months. The samples were aged in various sections of the U. S. under widely differing conditions of atmospheric contamination such as high sulphur dioxide content, high water-gas content and high dust content. The temperatures and amount of light varied widely. The details of physical and chemical analyses and the changes of physical and chemical constants of the samples after aging are tabulated, but original test values are not stated in comparison. Tub sizing is shown to improve resistance of various papers toward aging.—A. P.-C.

Examination of Vegetable Parchment for Packing Dairy Products. Paul S. Arup. J. Dept. Agr. Ireland 31: 282-287 (1932).—The following standards for vegetable parchment suitable for packing dairy products are tentatively suggested on the basis of the results of analysis of 82 samples: moisture, maximum 10 per cent; ash, 0.45 per cent; water-soluble extract, 1.3 per cent; bursting strength (Ashcroft), minimum 1 lb. per sq. in. per lb. ream weight. The strength immediately after wetting should be at least 33 per cent of the strength of the unwetted sample. The amount of reducing material in the water-soluble extract serves as a guide to the detection of added sugar. An unduly high water-soluble extract renders the parchment particularly susceptible to attack by molds. The water-soluble extract from genuine vegetable parchment consists of decomposition products of lignocellulose.—A. P.-C.

Protective Coating for Paper and Paper Articles. H. J. Prins. Belg. pat. 288,714 (June 30, 1932).—Paper is treated with latex or an emulsion of rubber, guttapercha, etc., and then with a waxy substance.—A. P.-C.

Composition for Coating Stencil Sheets. Kenneth W. Carr assignor to Ditto Inc. U. S. pat. 1,878,672 (Sept. 20, 1932).—Peanut oil is used together with a reaction product of phenol, tung oil and formaldehyde.—A. P.-C.

Parchmentized Paper. Gabriel Filliat. Fr. pat. 729,918 (March 25, 1931).—Paper which has been treated with sulphuric acid is freed from acid by standing the paper vertically in rolls and allowing washing liquid to traverse the rolls by gravity.—A. P.-C.

Reinforced Parchmentized Paper. Gabriel Filliat and S. J. A. Isnard. Fr. pat. 729,920 (March 25, 1931).—Paper parchmentized by sulphuric acid is reinforced by means of threads—A. P.-C.

Cellular Pulp Product Suitable for Use As Heat or Sound Insulation. Frederick R. Wenger. U. S. pat. 1,878,047 (Sept. 20, 1932).—Carbon dioxide gas is introduced into a mass of wet cellulosic pulp, and the mass is dried—A. P.-C.

The Surface Treatment of Acoustic Tile. Herbert J. Plagge, Lionel K. Arnold and Edward R. Whittemore. Paper Trade J. 96, No. 6: 27-29 (Feb. 9, 1933).—A constructive quantitative and qualitative study of surface treatment that can apply to any of the common fiber boards, showing that acoustic tile has a specific absorption coefficient, characteristic of the fiber mass and which may be altered to some extent by such surface treatment as bevelling and grooving—A. P.-C.

Process for the Manufacture of Waterproof Roofing Papers. Bitumen Investments, Inc. Fr. pat. 735,847 (April 22, 1932).—Suitable impregnating agents (*e.g.*, bitumen, resins, etc.) in amounts at least equal to the weight of fiber and in the form of solution or of colloidal suspension are added to the stock in the beater or in the mixing chests; a coagulating agent such as alum is added if necessary, and the stock is run on the paper or board machine.—A. P.-C.

Wood Substitute. A. de Samsonow. Brit. pat. 353,186 (June 16, 1930).—Bundles of generally parallel fibers still associated with natural binders such as material of papyrus, bamboo, straw, reeds, cane trash or subdivided wood are treated with a binder capable of being hardened by the action of an artificial or natural resin composition, or a rubber, casein or albumin binder. A fungicide also may be added and the material is compressed into desired form—A. P.-C.

Insulating Materials. N. V. de Bataafsche Petroleum Maatschappij. Fr. pat. 731,427 (Feb. 15, 1932).—Insulating materials are made by impregnating paper, cotton, silk, etc., with hydrocarbon solvents below 40 deg. C., preferably pentane or its homologs of lower boiling-point, and then introducing the paper, etc., into an insulating and viscous substance and heating, preferably under reduced pressure, to a temperature necessary to remove the solvent.—A. P.-C.

Pulp Operating Efficiencies. John A. C. Kavanagh. Paper Trade J. 96, No. 7: 55, 57 (Feb. 16, 1933).—A brief discussion of some of the underlying trends in the pulp industry, covering production, cost, labor and yield as relates to the economic changes in the pulp industry in the course of the last three years.—A. P.-C.

United States Patents on Paper Making. Fourth Quarter, 1932. Clarence J. West. Paper Trade J. 96, No. 6: 36-38 (Feb. 9, 1933).—A list in numerical order of patents relating to pulp and paper making issued at Washington in Oct., Nov. and Dec. 1932.—A. P.-C.

Truck for Handling News Print Rolls. Thomas Johancen and Edward E. Kehoe, assignors to The Monomelt Co. U. S. pat. 1,887,134 (Nov. 8, 1932).—The patent covers a small truck for the handling of a single roll of news print. It is constructed so that, when the roll has been placed on the truck and is tilted it slowly and automatically settles down to a practically horizontal position; after the roll has been unloaded from the truck, the latter can be quickly restored to the loading position.—A. P.-C.

Production Standards in a Paper Mill According to the "Refa" System. C. Schlingmann, Mannheim. Zellstoff Papier, 12, No. 12: 495-97 (Dec., 1932).—Description of the system.—J. F. O.

Process and arrangement for the automatic weighing of continuously transported materials. Osakeyhtio Toledo A. Bol., Helsingfors. Finn. pat. 14,495 (March 7, 1931).—J. F. O.

Process and Device for the Regulation of the Consistency, Density, Viscosity, and Other Properties of Liquids. Zellstofffabrik Waldhof, Mannheim. Nor. pat. 51,351 (Oct. 3, 1927).—The changable resistance from the rubbing of the liquid is utilized as the means of control.—J. F. O.

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Frankel Carbon & Ribbon Manfg. Co., Berengaria, Southampton, 1 cs.

VELLUM PAPER

——, Rex, Genoa, 12 cs.

MISCELLANEOUS PAPER

Japan Paper Co., P. Maersk, Kobe, 18 cs.

RAGS, BAGGINGS, ETC.

Banco Coml. Italiane Trust Co., Amer. Merchant, London, 59 bls. rags; ——, Amer. Merchant, London, 28 bls. rags; ——, P. Maersk, Kobe, 70 bls. rags; Banco Coml. Italiane Trust Co., P. Maersk, Kobe, 100 bls. rags; E. J. Keller Co. Inc., Black Hawk, ——, 234 bls. bagging; E. J. Keller Co. Inc., Black Hawk, ——, 92 bls. rags; E. J. Keller Co. Inc., Black Hawk, ——, 267 bls. flax waste; Banco Coml. Italiane Trust Co., Black Hawk, Antwerp, 163 bls. flax waste; Van Oppen & Co., Black Hawk, Antwerp, 61 bls. bagging; Van Oppen & Co., Black Hawk, Antwerp, 55 bls. rags; Banco Coml. Italiane Trust Co., Pr. Polk, Marseilles, 35 bls. rags; J. Cohen Son Co., Scythia, Liverpool, 29 bls. rags; Chase National Bank, Binnendyk, Rotterdam, 110 bls. cotton waste; G. A. Henshaw & Son, Binnendyk, Rotterdam, 59 bls. rags; ——, Clairton, Dandee, 154 bls. paper stock; ——, Clairton, Manchester, 395 bls. cotton waste.

CHINA CLAY

Whitaker Clark & Daniels, Scythia, Liverpool, 690 bags china clay.

WOOD PULP

Lagerloef Trading Co., Scanyork, Wiborg, 2540 bls. sulphite, 461 tons; Atterbury Bros. Inc., Scanyork, Wiborg, 162 bls. sulphite, 27 tons; Lagerloef Trading Co., Scanyork, Wiborg, 588 bls. mechanical, 101 tons; Castle & Overton, Inc., Scanyork, Wiborg, 2059 bls. wood pulp, 412 tons; Lagerloef Trading Co., Scanyork, Helsingfors, 1209 bls. sulphite, 205 tons; Castle & Overton, Inc., Binnendyk, Rotterdam, 956 bls. wood pulp.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 11, 1933

Halifax Power & Pulp Co., Dagali, Sheet Harbor, 8747 bls. pulp; Bulkley Dunton & Co., Karpfanger, ——, 10450 bls. wood pulp; Bulkley Dunton & Co., Pajala, ——, 2000 bls. wood pulp; Bulkley Dunton & Co., Griesheim, ——, 1600 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING NOVEMBER 11, 1933

Bulkley Dunton & Co., Tysla, ——, 3100 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 11, 1933

Spaulding Fibre Co., Black Hawk, Antwerp, 421 bls. flax waste; H. P. Lambert, Black Hawk, Antwerp, 43 bls. paper stock; Meredith Linen Mills, Black Hawk, Antwerp, 79 bls. flax waste; F. J. Fawcett, Black Hawk, Antwerp, 83 bls. flax waste; Fort Dupee Sawyer Co., Black Hawk, Antwerp, 22 bls. rags; G. F. Malcolm Co., Scythia, Liverpool, 21 cs. tissue paper; M. Sone, Grandon, Hamburg, 250 bls. wood pulp; Bulkley Dunton & Co, Pajala, ——, 625 bls. wood pulp; Bulkley Dunton & Co., Grandon, ——, 700 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 11, 1933

W. J. Jones Co., Isarco, Leghorn, 4 cs. card board; Union Waste Co., P. Maersk, Kobe, 55 bls. thread waste; D. Galloway, P. Maersk, Kobe, 150 bls. cotton waste; Chase National Bank, P. Maersk, Kobe, 50 bls. cotton waste; The Lang Co., Black Hawk, Antwerp, 186 bls. rags; Castle & Overton, Inc., Black Hawk, Antwerp, 142 bls. rags; N. Y. Trust Co., L. A. Christensen, Barcelona, 65 bls. rags; Union Waste Co., Norfolk Maru, Kobe, 85 bls. rags; Laferloef Trading Co., Scanyork, Wiborg, 6624 bls. sulphite, 1324 tons; Castle & Overton, Inc., Scanyork, Wiborg, 1764 wood pulp, 352 tons; Bulkley Dunton & Co., Grandon, ——, 300 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 11, 1933

——, P. Maersk, Shanghai, 304 bls. rags; Congoleum Nairn Co., Collamer, Havre, 158 bls. rags; Chase National Bank, Norfolk Maru, Kobe, 160 bls. rags; G. A. Henshaw & Son, Clairton, Manchester, 225 bls. waste paper; Parsons & Whittemore, Inc., C. of Hamburg, ——, 2500 bls. sulphite; Bulkley Dunton & Co., Vasaholm, ——, 625 bls. wood pulp; Bulkley Dunton & Co., Tysla, ——, 2315 bls. wood pulp; Bulkley Dunton & Co., Karpfanger, ——, 815 bls. wood pulp.

SAVANNAH IMPORTS

WEEK ENDING NOVEMBER 11, 1933

1t Natl. Bank of Boston, P. Maersk, Shanghai, 304 bls. bagging.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 11, 1933

Irving Trust Co., Clairton, Manchester, 40 bls. bagging.

NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 11, 1933

Bulkley Dunton & Co., Bockenheim, ——, 2000 bls. wood pulp; Bulkley Dunton & Co., Tysla, ——, 8870 bls. wood pulp.

GALVESTON IMPORTS

WEEK ENDING NOVEMBER 11, 1933

Parsons & Whittemore, Inc., West Cobalt, ——, 300 bls. sulphite.

New Line of Morris Pumps

A new line of double-suction split-case pumps specially designed for operation at high speed is announced by Morris Machine Works of Baldwinsville, N. Y., who are the originators of the centrifugal pump and the oldest American manufacturer of this type of pumping equipment.

These pumps have been developed to provide a suitable unit for direct connection to electric motors or steam turbines operating at 3500 r.p.m. They may also be belt-driven or operated through gears by low-speed drivers, such as gasoline engines.

While these high-speed pumping units follow the principles of standard centrifugal pump design, each element has special provisions to meet high-speed requirements. The impellers, shaft and couplings are first individually tested for perfect rotative balance and then the entire rotating unit is also similarly tested before the pump is assembled. The design and finish of the impeller are also specially refined to minimize friction and eddy losses.

Deep groove, heavy-duty precision ball bearings are used on each side of the pump to take care of both radial and thrust loads, and the bearing supports, bed plate, pump casing, and shaft are all specially proportioned to provide complete rigidity.

These pumps are built in sizes from 1½ inches to 5 inches and are suitable for general pumping duty, factory service, chemical process work, municipal water supply, and for handling other liquids as well as water. Complete information may be obtained by addressing Morris Machine Works, Baldwinsville, N. Y.

Fire Visits Logan-Long Plant

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, November 6, 1933—Fire of undetermined origin caused a loss of several thousand dollars, it is reported, in the paper plant of the Logan-Long Company at Franklin, the past week.

The blaze started in the stock room and was confined to that department. The fire smoldered for many hours, the Franklin department successfully controlling it after a long battle. Accustomed to the manner of fighting fires of this kind in the past in paper plants, the Franklin force acquitted itself with great credit. It seemed that the men understood just where to begin attacking the flame and that by their promptness they had prevented what might ordinarily have been a serious conflagration.

The structure involved was a long one and one-half story building located along the Dixie highway, at the southern edge of Franklin.

R. M. Snell Heads Loan Corp.

NORTH AGAWAM, Mass., November 13, 1933.—Ralph M. Snell, president of the Huntington Paper Company, has just been elected president of the newly incorporated Berkshire Community Loan Corporation of Lee.

This organization has been created to assist southern Berkshire county industries through the use of Reconstruction Finance Corporation funds and thereby assist in the work of the NRA.

Other officers of the corporation are: vice-president, Walter Aiken of the Clark-Aiken Company, Lee, Mass.; treasurer, Frank Diamond of the Lee National Bank, secretary, Charles V. Derrick of the Hurlbut Paper Company.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 15, 1933.

Trading in the local paper market continues listless, affected to some extent by the monetary situation, and the delay in approving the code for the industry. Sales forces of some of the leading paper organizations express the view that there will be little expansion of buying until after the turn of the year.

The news print paper market is slightly more active. Advertising volume is running a little ahead of the corresponding period last year. Production in the United States, Canada and Newfoundland is being maintained in sufficient volume to take care of current requirements. Efforts are being made to stabilize quotations.

Steadiness prevails in the paper board market. Demand for box board is fairly persistent. Prices remain unchanged. The fine paper market is rather quiet at present. Tissues are moving in good volume. The coarse paper market is moderately active. Kraft wrapping paper prices are holding to previously quoted levels.

Mechanical Pulp

The ground wood pulp market continues in a strong statistical position. Manufacturing operations in North America and abroad are practically keyed to consumption and there are no undue accumulations. Prices are holding up well and reports of concessions are infrequent.

Chemical Pulp

Conditions in the chemical pulp market are practically unchanged. Recent price advances on several of the grades are well sustained. Imported bleached sulphite is quoted at from $2.80 to $3.00; and easy bleaching sulphite at from $2.15 to $2.30, all on dock, Atlantic ports.

Old Rope and Bagging

The old rope market continues quiet. Demand for both foreign and domestic old manila rope is light. Small mixed rope is moving slowly. Old rope prices are nominal. The bagging market is dull. Gunny and spot bagging are spotty, while roofing bagging is not arousing much interest at present.

Rags

Paper mill request for domestic rags is listless. New cotton rags are rather spotty, with the exception of No. 1 white shirt cuttings which are going forward in fairly heavy volume. Roofing grades are slightly firmer. The imported rag market is still affected by the depreciated currency situation.

Waste Paper

The paper stock market developed further weaknesses. Although board mill demand for the lower grades improved slightly, prices again declined. The higher grades of waste paper are also softer, including white envelope cuttings hard and soft white shavings, and book and ledger stock.

Twine

Most of the business transacted in the local twine market during the past week was along routine lines. Demand for the various grades is fairly active and should be well maintained, until the end of the year, at least. Despite the usual keen competition, prices are steady.

Indianapolis Paper Market Steady

INDIANAPOLIS, Ind., November 13, 1933—Steadiness might be a one-word description of the local paper market during the last week. While some of the major codes have been signed, there remains a large number of industrial classifications that still are up in the air concerning what they may depend on in the way of regulation and their own business is being held up, particularly their advertising and other possible expansion moves that would help the paper industry. There are innumerable catalogue and direct by mail projects that are being held up entirely until the heads of these various businesses know where they stand. While this is not of immediate help to the paper industry, the leaders of the trade in Indiana feel there is a strong undertone to the trade and in their talks with other business men know that much paper business is in prospect when various regulations are effected.

Meanwhile local markets are holding fairly firm and business continues about the same as it has been for the last month. Demand, however, for strictly holiday merchandise is picking up seasonably and all indications point to a larger volume than last year. Holiday boxes, paper decorations and all similar merchandise now is proceeding to the retail trade in good volume, in fact the demand seemed to start earlier this year than during past years. The local trade does not believe that the lateness of Thanksgiving will make a particle of difference in the Christmas demand.

Kraft prices seem well maintained at the somewhat higher levels that were reached some time ago. Most grades of fine papers show but little variation either in demand or price and books and covers also show the same steadiness. Demand for newsprint is somewhat uncertain because of advertising conditions, but the volume now being sold is ahead of the same time last year, which is encouraging.

Paper stock men still are in the doldrums. Mill prices have not improved and the local trade is merely biding its time until better prices arrive, which they firmly believe will come shortly.

New S. & W. Installations

It is reported that the Smith & Winchester Manufacturing Company, South Windhad, Conn., has just completed a specially designed wet machine and also a new drying machine for a large specialty mill in eastern Massachusetts. This follows the company's recent installation this fall of two new wet machines for the Sterling Fibre Company at Eagleville, Conn.

This same company also has just shipped a 1/16 barrel bottomer to the Millheiser Bag Company, Richmond, Va

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 15, 1933.

BLANC FIXE.—Steadiness prevails in the blanc fixe market. Prices are holding to previously quoted levels. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is moderately active. Shipments against contract are moving in fairly good volume. Prices are holding to schedule. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market is marking time. Domestic standard ground is quoted at 12½ cents and finely ground at 13½ cents per pound. Argentine standard ground is selling at 15½ cents and finely ground at 15¾ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Paper mill demand for caustic soda is normal for the time of year. Prices remain unchanged. Solid caustic soda is quoted at from $2.55 to $3.00; while the flake and ground are selling at from $2.95 to $3.00 per 100 pounds, in large drums, at works.

CHINA CLAY.—The position of the china clay market is practically unchanged. Prices are holding to schedule. Imported china clay is quoted at from $12 to $17 per ton, ship side; while domestic paper making clay is selling at from $4.50 to $12.00 per ton, at mine.

CHLORINE.—The chlorine market is exhibiting a strong undertone. Contract shipments are moving with regularity. Prices rule steady to firm. Chlorine is still quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—Quietness reigns in the rosin market. The grades of gum rosin used in the paper mills are quoted at from $4.95 to $5 per 280 pounds, in barrels, at works; while wood rosin is selling at $4.00 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—The salt cake market is improving. Demand from the mills is persistent. Prices are firm. Salt cake is quoted at from $14 to $14.50; chrome salt cake at from $13.50 to $14 per ton, at works; while imported salt cake is selling at from $14 to $14.50 per ton, on dock.

SODA ASH.—Demand for soda ash from the paper mills continues excellent. The contract movement is well up to average. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.30; and in barrels, $1.43.

STARCH.—The starch market is fairly active. Paper mill demand at present is mainly along routine lines. Prices are holding to schedule. Special paper making starch is quoted at $2.67 per 100 pounds, in bags; and at $2.95 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Trading in the sulphate of alumina market is fairly brisk. Prices remain unchanged. Commercial grades are quoted at from $1.25 to $1.46; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Business in the talc market is fairly satisfactory for the season. Prices are holding to schedule. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
B...			
S. & S. C.	5.50	@	—
S. & S. C. Litho	5.75	@	—
M. F.	5.25	@	—
Coated and Enamel	6.15	@	9.30
Coated Litho	6.90	@	—
Th... Pe... Steam—			
White No. 1	.60	@	.80
White No. 2	.55	@	.70
A... Tarnish M. G. only	.75	@	.80
Colored	.80	@	1.00
Kraft	.75	@	.80
Manila	.65	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.09	@	5.00
Glassine—			
Bleached basis 25 lbs., No. 1	.11	@	—
No. 2	.10	@	—
Bleached basis 20 lbs.	.13	@	—

(Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Side Runs	25.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.87½	@	—
Southern	3.87½	@	—
Imported	Nominal		
Boards—per ton—			
News	45.00	@	50.00
Chip	42.50	@	47.50
Binders Boards	68.00	@	72.00
Kraft Liner	75.00	@	85.00
Standard 85 Test Jute Liner	50.00	@	55.00
Sgl. Mla. Ll. Chip	52.50	@	55.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	27.50	@	29.00
Dry	28.00	@	29.50

(F.o.b. Mill)

No. 1 Domestic and Canadian	24.00	@	28.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.80	@	3.00
Easy Bleaching	2.15	@	2.30
No. 1 strong unbleached	2.15	@	2.25
Mitscherlich Unbleached	2.15	@	2.25
No. 2 Strong unbleached	2.00	@	2.05
No. 1 Kraft	1.75	@	1.85
No. 2 Kraft	1.60	@	1.70
Sulphate—			
Bleached	2.75	@	3.25

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	2.50	@	3.75
Easy Bleaching	2.05	@	2.15
News	1.90	@	2.00
Mitscherlich unbleached	2.25	@	2.50
Kraft (Domestic)	1.60	@	2.75
Soda Bleached	2.50	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	7.00
Silesias No. 1	4.25	@	4.50
New Unbleached	6.75	@	7.25
New Soft Blacks	3.00	@	3.25
Blue Overall	4.00	@	4.25
Fancy	2.50	@	2.75
Washables	1.75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	.65	@	.70
No. 2	.50	@	.60
No. 3	.40	@	.50
No. 4	.35	@	.40
No. 5A	.30	@	.35

Foreign Rags

New Rags

New Dark Cuttings	1.50	@	1.60
New Mixed Cuttings	1.60	@	1.70
New Light Silesias	3.50	@	3.75
Light Flannelettes	3.25	@	3.50
Unbleached Cuttings	5.75	@	6.00
New White Cuttings	5.50	@	6.00
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	3.75	@	4.00
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.60	@	1.75
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.65	@	1.80
French Blue Linens	2.10	@	2.25
German Blue Linens	1.85	@	2.00
German Blue Cottons	1.50	@	1.60
Checks and Blues	1.30	@	1.40
Lindsay Garments	1.10	@	1.15
Dark Cottons	1.00	@	1.10
Old Shopperies	.85	@	.90
New Shopperies	.80	@	.85
French Blues	1.50	@	1.65

Old Rope and Bagging

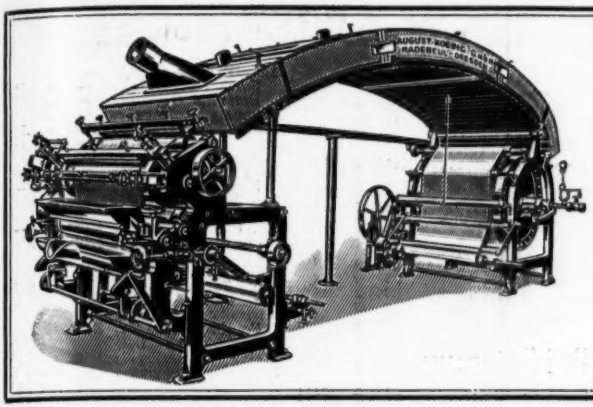
(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.30	@	1.40
Domestic	1.25	@	1.35
Wool Tares, light	1.05	@	1.15
Wool Tares, heavy	1.05	@	1.15
Bright Bagging	1.00	@	1.10
Manila Rope—			
Foreign	2.50	@	2.75
Domestic	2.50	@	2.75
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	1.50	@	1.75
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.50	@	2.60
Ordinary Hard White No. 1	2.25	@	2.35
Hard White No. 2	2.10	@	2.20
Soft White No. 1	2.00	@	2.10
Flat Stock			
Stitchless	.95	@	1.05
Overissue Mag	.95	@	1.05
Solid Flat Book	.75	@	.85
Crumpled No. 1	.60	@	.70
Solid Book Ledger	1.60	@	1.85
Ledger Stock	.95	@	1.05
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.50	@	1.60
New Cuttings	1.10	@	1.20
Extra No. 1 old	.75	@	.85
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.10	@	1.20
Strictly Overissue	.60	@	.65
Strictly Folded	.45	@	.55
No. 1 Mixed Paper	.28	@	.33



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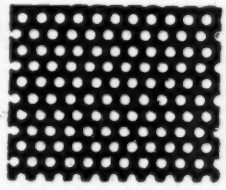

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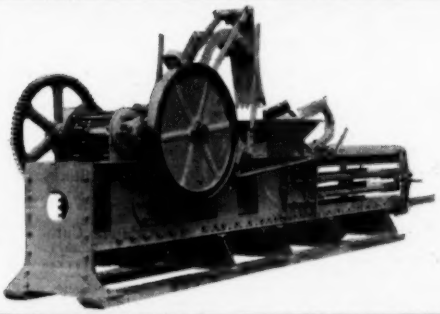

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Twines
(F. o. b. Mill)

Cotton—			
B. C. 18 basis	.30	@	.32
No. 2	.20	@	.22
No. 3	.19	@	.20
No. 4	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13½	@	.16½
No. 2	.15	@	.16
Tube Rope—			
4-ply and larger	.09¾	@	.11¾
Fine Tube Rope—			
4-ply	.13¾	@	.14¾
3-ply	.14¾	@	.14¾
2-ply	.15¾	@	.15¾
Paper Makers Twine	.08¾	@	.10¾
Box Twine, 2-3 ply	.12¾	@	.13½
White Hemp	.12¾	@	.15¾
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M F Book	.06½	@	.07¼
No. 2 M F Book	.05¼	@	.06¼
No. 1 S&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03½
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	—
Solid News	43.50	@	—
Manila Lined Chip	47.50	@	—
Patent coated	55.00	@	—
Container Lined—			
85 Test	60.00	@	65.00
100 Test	60.00	@	70.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	1.80
No. 1 Hard White	1.40	@	1.50
No. 1 Soft White	1.20	@	1.30
Ledger & Writings	.80	@	.90
Solid Books	.80	@	.90
Blanks	1.00	@	1.05
Krafts	.90	@	1.00
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	1.00	@	1.05
Print Manila	.60	@	.65
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.55	@	.65
Mixed Papers—			
No. 1	.50	@	.55
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.30
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04½	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.10
Manila Sul., No. 1	.03	@	.06
Manila No. 2	.03	@	.05
No. 1 Kraft	.05¼	@	.06½
No. 2 Kraft	.03¾	@	.05
Southern Kraft	2.75	@	4.00
Common Bogus	.03	@	.04½
(Delivered Philadelphia)			
News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	37.00	@	45.00
Chip Board	40.00	@	45.00
Wood Pulp Board	70.00	@	85.00
Binder Boards			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.03½	@	.04
New White, No. 2.	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings			
No. 1 Hard White	2.30	@	2.40
No. 2 Hard White	2.10	@	2.15
No. 1 Soft White	2.05	@	2.10
No. 2 Soft White	1.15	@	1.25
No. 1 Mixed	.95	@	1.00
No. 2 Mixed	.75	@	.80
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.05	@	1.10
No. 1 Books, heavy	.90	@	1.00
No. 2 Books, light	.75	@	.85
No. 1 New Manila	1.20	@	1.50
No. 1 Old Manila	.85	@	.90
Print Manila	.75	@	.80
Container Manila	.75	@	.85
Old Kraft	.90	@	1.05
Common Paper	.35	@	.45
No. 1 Mixed Paper	.35	@	.40
Straw Board Chip	.35	@	.40
Binders Board Chip	.35	@	.40
Corrugated Board	.50	@	.60
Overissue News	.55	@	.65
Old Newspapers	—	@	.45

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11
Rag Content	.12	@	.30
All Rag	.36	@	.42
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book M F	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.03¾	@	.04½
(F. o. b. Boston)			
Southern Kraft	.03¾	@	.04½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	44.50	@	—
Straw Board, rolls	30.00	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	45.00	@	50.00
Chip Board	42.50	@	47.00
Chip Board (Creasing)	45.00	@	—
Single Manila Lined Chip	52.50	@	62.50
Single White, Patent Coated News Board—			
Bender	62.50	@	72.50
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.40	@	—
No. 1 Soft White	2.10	@	—
No. 1 Mixed	.80	@	.90
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	1.00	@	1.10
No. 1 Books, heavy	1.00	@	1.10
No. 1 Books, light	.75	@	.85
Crumpled Stiffness Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.95	@	1.05
White Blank News	1.15	@	1.25
No. 1 Kraft	1.05	@	1.10
Manila	1.05	@	1.10
No. 1 Mixed Papers	.25	@	.30
Print Manila	.50	@	.55
Overissue News	.55	@	.60
Old Newspapers	.42½	@	.47½
Box Board Chips	.32½	@	.35
Corrugated Boxes	—	@	.35
Screening Wrappers	.60	@	.70

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	—	@	2.25
Domestic	—	@	2.50
Transmission Rope	1.50	@	—
Mixed Strings	.60	@	.70
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.20	@	—
Domestic	—	@	1.00
Bleachery Burlap	3.00	@	3.25
No. 1 Scrap Burlap	1.40	@	—
Scrap Sisal	1.10	@	1.15
Scrap Sisal for shredding	1.15	@	1.30
Wool Tares, heavy	—	@	1.05
New Burlap Cuttings	1.15	@	1.25
Australian Wool Pouches	2.25	@	2.50
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	—	@	.75
Bagging No. 2	.50	@	.60

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.02	@	.02¼
New White No. 1	.06½	@	—
New White No. 2	.04½	@	.05
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.07	@	.07¼
Blue Cheviot	—	@	4.65
Fancy	—	@	.22½
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.03	@	.03¾
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	—
White No. 2—			
Repacked	.01½	@	.01¾
Miscellaneous	.01½	@	.01¾
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	1.10	@	1.25
Miscellaneous	.85	@	.90
Black Stockings	2.25	@	2.50
Roofing Stock—			
No. 1	.60	@	.65
No. 2	.55	@	.60
No. 3	.35	@	.45

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.10	@	—
New White Shirt Cuttings	5.50	@	6.50
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.55	@	1.60
Old Linsey Garments	—	@	1.10

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.09¾	@	—
No. 2 Sulphite	.08	@	—
No. 1 Colored	.10¾	@	—
No. 2 Colored	.08½	@	.10¾
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.30	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.22½	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	50.00	@	55.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.10
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.55	@	.80
Kraft	1.25	@	1.50
News and Scrap			
Strictly Overissue	1.00	@	—
Strictly Folded	.85	@	—
No. 1 Mixed Paper	.70	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.05¼	@	.05½
Fancy Shirt Cuttings	.02¼	@	.02¼